EARLY CHILDHOOD NATURE CURRICULUM FOR THE FORMAL PRESCHOOL CLASSROOM

CURRICULUM PROJECT

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College of Education and Human Services Professions

By

Andrea Joy Bierbrauer, B.S.

University of Minnesota Duluth

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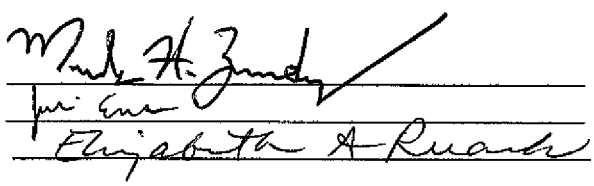
Thesis Committee:
Mark Zmudy, Ph.D., Chair
Julie Ernst, Ph.D.
Elizabeth Ruark, M.Ed.



ABSTRACT

Children who are close to nature tend to relate to it as a source of wonder, joy, and awe; their spirits are nurtured by nature and they discover through it "sources of human sensibility." These outdoor interactions enhance learning and the quality of life over the span of ones lifetime (Wilson,1992). Research indicates that children must develop a sense of respect and care for the natural world during early grades or be at risk of never developing such attitudes (Davis, 1998, Louv, 2008; & Wilson, 1992).

This early childhood nature curriculum project provides twelve monthly lessons and newsletters to the preschool teachers at Happy Time Day Care Center of Duluth, Minnesota. Each lesson focuses on nature awareness and appreciation with both indoor and outdoor natural experiences that meet Minnesota's Early Learning Standards, NAEYC Early Childhood Program Standards, and the National Education Science Standards.

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CHAPTER ONE

INTRODUCTION

As the world becomes "green", we ponder at what age we should begin to teach children environmental education (EE). Research indicates that children must develop a sense of respect and caring for the natural world during early grades or be at risk of never developing such attitudes (Davis, 1998, Louv, 2008; & Wilson, 1992). Moreover, many believe that the earlier children start learning EE the more likely those children will be to foster positive attitudes towards the natural environment (Davis, 1998, White, 2004; Wilson, 1992, 1993).

Environment-based education is emerging as an effective means for motivating students and making learning relevant through real-world projects and problem-solving opportunities. Environment-based education is a general term for describing formal instructional programs that adopt local natural and socio-cultural environments as the context for a significant share of students' education experiences (Athman, 2004).

Wilson (1993) states that EE for early childhood aged children is usually affiliated with either early childhood education or EE programs. Typically, early childhood programs devote several curricular units to environmental themes, such as seeds, backyard animals, trees, or seasons. This approach provides some valuable nature-related experience for young children, but is likely to have limited impact given its sporadic occurrence in the overall curriculum. Wilson (1993) also states that EE programs in

informal settings such as nature centers for preschool children are offered in EE, and they usually take the form of individual sessions planned around interests of preschool children and are open to the general public (Wilson, 1993).

Even though some schools use EE in their curriculum, Williams (2000) points out that EE is unfocused and uncoordinated. In congruence with Williams (2000), a research study conducted by Lieberman (1998) reported that the mainstream education community has never fully embraced environment-based education as an integral part of the formal education system.

Many researchers have reported the importance and goals of EE curricula for early childhood pupils (Davis, 1998; Flanagan, 2006; Wilson, 1992; Wilson 1993). However, to my knowledge very few primary schools have integrated nature activities into their programs. Therefore, the purpose of this curriculum is to integrate nature based EE activities into an early childhood classroom, including both outdoor and indoor educational experiences.

Purpose of the Study

This curriculum provides EE lessons to be taught monthly to students at a daytime early childhood education center in the Midwest United States. Each lesson focuses on various aspects of nature awareness and appreciation while nurturing student development in the areas of inquiry and problem solving, age appropriate thinking skills, and friendship building; concepts which have been shown through research to be highly beneficial for youth in the primary grade levels, or kindergarten through third grade.

(Davis, 1998; Flanagan, 2006; White, 2004). The learning outcomes in this curriculum are aligned with Minnesota's Early Learning Standards, National Association for the Education for Young Children (NAEYC) Early Childhood Program Standards, and The National Education Science Standards.

Significance of Study

Many researchers of EE have found it useful to investigate the benefits of EE as they pertain to school aged youth. These studies have primarily indicated results that are positive, both physically and academically (Fjortoft, 2001; Wilson, 1992). For example, Wilson (1992) found that positive interactions with the natural world are an important part of healthy child development both physically and cognitively. Children who are close to nature tend to relate to it as a source of wonder, joy, and awe; their spirits are nurtured by nature and they discover through it "sources of human sensibility" (1992, p. 348). According to Wilson (1992), these interactions enhance learning and the quality of life over the span of ones lifetime. Additionally, Wilson (1994) has also conducted studies on the effects of participation in EE, the results of which have indicated that EE helps strengthen learning in core subjects such as science, math, geography, languages, arts, and social studies (Wilson 1994). Supporting Wilson, Fjortoft (2001) states that daily play experiences in a natural area significantly increases balance and coordination among young children, and is beneficial to one's spirit and emotions.

In congruence with the movement toward inclusion of environmental and nature based learning in the preschool setting, others have indicated the negative effects of not having EE in early childhood curricula. For example, White (2004) noted that not only does the loss of children's outdoor play and contact with the natural world negatively affect the growth and development of the whole child and his/her acquisition of knowledge; it also sets the stage for a continuing loss of the natural environment.

There is much literature that provides examples of how, specifically, EE should be taught in the schools (Benson & Miller, 2008; Ham & Sewing, 1988). Within this realm of research, most have focused on EE strategies for older youth and adolescents, with very little attention given to integrating environmental and nature based education into early childhood education (Lieberman & Hoody, 1998).

Assumptions

The present curriculum is geared toward early childhood youth aged three to eight years of age to the exclusion of students in grades four through twelve. The learning experiences throughout the curriculum have been designed to meet the needs of teachers and students at a specific childhood learning center, but can be adapted to other learning environments.

Limitations

This curriculum focuses on sensory awareness and appreciation of nature. The lessons are designed for the students to develop a connection with nature. No environmental issues are present in this curriculum. Sobel (1996) suggests no tragedies until fourth grade; we do not want to scare children away from appreciating and understanding nature. What is important is that children have an opportunity to bond with the natural world, to learn to love it, before being asked to heal its wounds (Sobel, 1996).

Definitions

- Environmental education- A learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO-United Nations Educational Scientific and Cultural Organization, Tbilisi Declaration, 1978).
- Early childhood program- Any group program in a center, school, or facility that serves children from birth through age eight. Early childhood programs include childcare centers, family, childcare homes, private and public preschools, kindergartens, and kindergarten through third grade (NAEYC, 1926).

Summary

The present Environmental Education-Early Childhood curriculum's goal is to provide monthly EE lessons throughout the school year for early childhood teachers; it also integrates natural materials into the different learning areas of the classroom. This curriculum provides the teacher with quality environmental activities that meet standards from the Minnesota's Early Learning Standards, as well as the early childhood learning standards set forth by the NAEYC. The curriculum emphasizes the academic benefits of teaching EE to young children. This curriculum will serve as an example that may guide other preschools or early childhood centers who would like to create their own nature curriculum in their respective centers.

CHAPTER TWO

LITERATURE REVIEW

For many decades, EE has been noted as an important part of both formal and non-formal education curricula (Gilbertson, Bates, McLaughlin, & Ewert 2006). In fact, the inclusion of nature based EE in school programs dates back as far as circa Earth Day, 1970 (Ham, S & Sewing D, 1988). Today, fifteen states require environmental based education in their elementary and secondary schools, and approximately one hundred and fifty universities and colleges grant degrees in environmental sciences (Williams, 2000). Over the past 30 years, the core field of EE has developed into one of the most effective paradigms of learning available today (The North American Association for Environmental Education, 2001).

Environmental Education

First, one must understand the definition of EE before one can teach it. EE is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (United Nations Educational Scientific and Cultural Organization [UNESCO] Tbilisi Declaration, 1978). The main goal for EE is to develop environmentally responsible and active citizens (Hines, Hungerford, & Tomera, 1986, 1987). Many also believe that the way we educate young children today about the

environment will have a great impact on the future quality of life for generations to come (Crim, Desjean-Perrotta, and Moseley 2008). As defined by the National Project for Excellence in Environmental Education (2001), EE is a process that aims to develop an environmentally literate citizenry that can compete in our global economy; has the skills, knowledge, and inclinations to make well-informed choices; and exercises the rights and responsibilities of members of a community. The main goal of EE is for people of all ages to know enough about environmental sciences and related social issues to make sound and well-reasoned environmental decisions (The North American Association for Environmental Education, 2001).

EE is universal, and can be taught to virtually anyone (Martin, 2003). It is generally accepted that EE's main audience is the public, and it is usually taught in a formal education setting or a non-formal education setting (Prince, 1999). Formal education settings include such places as preschools, primary schools, secondary and high schools, as well as colleges and universities. Non-formal education settings include for example, nature centers, zoos, aquariums, environmental learning centers, and camps (Gilbertson, Bates, McLaughlin, & Ewert 2006).

EE is interdisciplinary and uses many types of learning styles and intelligences (Martin, 2003). EE also allows instructors to draw from various and multiple disciplines, linking the methods and content of natural and social science, arts, mathematics, and humanities to help learners fully understand environmental issues (Flanagan, 2006). An important factor that has been noted in EE is that it can be designed to meet the needs of

children at their individual level, so starting at an earlier phase in life is feasible (Davis, 1998 & Wilson, 1994). The learner in EE is an active participant that engages in learning through a process of knowledge and skills building guided by personal interest (Hungerford, Peyton, & Wilke, 1980).

Early Childhood Education

According the NAEYC (1926) an early childhood program is any group program in a center, school, or facility that serves children from birth through age eight. Early childhood programs include childcare centers, family units in the home, foster or group homes, private and public preschools, kindergartens, and primary-grade schools. Primary grade school means kindergarten through third grade. Early Childhood Education usually separates students into classrooms based on development and age level. Infants are those newborn-12 months; toddlers are one year olds-two year olds; preschool includes three-five year olds; and primary students are those kindergarten-third grade (Essa, 1999). Early childhood professionals also are commonly referred to using various titles, depending on the preferences of each program. Some of these titles include caregiver, day care provider, early childhood educator, preschool teacher, and teacher.

The main goal of an early childhood program is to provide safe and nurturing care in a developmentally appropriate setting. Founded in 1926, NAEYC is an organization committed to fostering the growth and development of children from birth through age eight. Like their counterparts in older elementary and secondary formal and non-formal programs, early childhood centers use standards and guidelines to help steer and shape

their curricula so they are developmentally appropriate. Minnesota Early Learning Standards are intended to serve as guidelines for teachers and EE providers so they can thoughtfully plan and design daily curricula, instruction, and ongoing assessment for meeting children's individual needs (Minnesota Department of Education, 2005). NAEYC Early Childhood Program Standards ensure the quality of children's daily experiences in early childhood programs and promote positive learning outcomes (NAEYC, 1926).

NAEYC's Developmentally Appropriate Practices (DAP) serve as a framework that all early childhood programs can use to create their curricula. Guidelines for DAP include: a) creating a caring community of learners that support the development of the child such as teachers and parents; b) teaching to enhance development and learning of the child; c) planning a developmentally appropriate curriculum to achieve the programs' goals for the children; d) assessing children's development and learning; and e) establishing reciprocal relationships with families. DAP is based on the knowledge of how children develop and learn (Bredekamp and Carol, 1997). DAP means teaching children in ways that meets children where they are individually. Children learn at different rates and have different learning styles. DAP also helps each child reach challenging and achievable goals that contribute to ongoing development and learning (Bredekamp & Copple, 2006).

DAP is derived from the knowledge of how each child develops and learns individually. It is necessary for early childhood professionals to acquire this knowledge

through relationships with the child's family. Collaboration between the home and school is of the utmost importance in Early Childhood Education. Families are of primary importance in children's development. Besides parents, families may include others who are responsible for children such as grandparents, guardians, foster families, and other extended family members. Studies show that children's development is benefited when parents/guardians and early childhood staff share a common commitment to the best interests of children by communicating openly and having mutual respect (Essa, 1999 & Isbell, 1995).

According to Essa (1999), programs structured toward early childhood education typically include specific activities to enhance socialization, cognitive skills, and overall development of young children. Isbell (1995) adds that classroom activities provide opportunities for children to participate individually, in teams, and in small groups. Included are both teacher-directed and child-directed activities. Childcare centers in particular offer a special component, allowing children to participate in play activities that are self-directed (Isbell, 1995). Many early childhood classrooms feature "learning centers" as the primary vehicle for child-initiated learning experiences. Learning centers are sometimes referred to as "interest centers" and are arranged to support multi-intelligences and developmental domains (Wilson, 1993). Learning centers are designated areas within the classroom, which are based on interest, ability, and needs of students. Learning centers are child-directed, where children work at their own developmental level. Learning centers enhance social skills, cooperation, and creativity.

Young children are naturally interested in the world in which they live; and centers are symbolic representations of their world (Isbell, 1995)

According to Essa (1999), early childhood centers should allow time for outdoor activities in their daily schedule. Outdoor play has been shown to benefit children both physically as well as developmentally. Essa (1999) states that outdoor play improves gross motor, social, language, and problem solving skills. Outdoor play also reinforces emotional and creative expressions, and provides children the opportunity to learn about their natural world by observing and noting seasonal and weather changes (Essa, 1999).

Assessment of individual children's development and learning is essential for planning and implementing appropriate curriculums (Bredekamp & Copple, 2006). An accurate assessment of young children is difficult because their development and learning is rapid. Developmentally appropriate assessment of young children's progress and achievements is ongoing, strategic, and purposeful (Bredekamp & Copple, 1997). The content of assessments reflects progress toward important learning and developmental goals. Within the scope of assessment in early childhood centers, it is imperative that the methods of assessment are appropriate to the age and experiences of young children. Assessments recognize special learning, developmental needs, and allow for differences in styles and rates of learning (Bredekamp & Copple, 1997 & 2006).

Benefits of Environmental Education

Much research has been conducted that investigates the specific benefits of EE and why EE is important for young children (Davis, 1998; Fjortoft, 2001; Louv, 2008; Wilson, 1993). For example, Wilson (1993) states that play is the fundamental tool for children to explore their world, their environment, their interpersonal and physical relationships, and their self-worth. The outdoors is the ideal circumstance to encourage children to be themselves, to explore, to experience, to move, and to make the most of opportunities offered in a less-restricted manner (Wilson, 1993). Essa (1999) adds that play is essential for the children to develop intellectually, physically, emotionally, and socially. Through play, children learn to express their thoughts and feelings, develop language and social skills, and become aware of cultural diversity in their community. (Staempfli, 2008). Supporting Essa and Staempfli, Ginsburg (2007) states that play is essential to development because it contributes to the cognitive, physical, social, and emotional well-being of children and youth. Play also offers an ideal opportunity for parents to engage fully with their children. While playing outdoors, a child is likely to encounter opportunities for decision making that stimulate problem solving and creative thinking because outdoor spaces are often more varied and less structured than indoor spaces (Burdette and Whitaker, 2005). Louv (2008) has indicated that exposure to nature can be a powerful form of therapy for many who experience depression, obesity, and attention deficit disorder. Burdette and Whitaker (2005) also state that active, unstructured, outdoor play needs to be restored in children's lives. Efforts to increase

physical activity in preschoolers might be more successful if physical activity is promoted as play, and if social, emotional, and cognitive aspects of child development are emphasized as well as physical health. Exposure to nature has also been shown to reduce stress and increase attention spans (US Fish and Wildlife Services, 2007).

Davis (1998) suggests that early childhood professionals need to lobby for the provision of adequate 'green spaces' for children to have quality experiences with nature in all early childhood settings and in their communities. Children need places where they can explore and get dirty, touch living plants, and care for and about the insects, earthworms, birds, fish, frogs, and other forms of life.

EE also has been shown to have positive benefits on school environments as well as offering support to students' core academic subjects. According to Basile & White (2000), making connections with concepts in mathematics, social studies, and language arts is important. For young children, all disciplines naturally fit together. Combining concepts is critical as children move away from environmental science and begin to engage in decision-making and citizenship activities related to EE.

According to Flanagan (2006), EE is an interdisciplinary practice that helps reinforce learning in subjects such as science, math, geography, languages arts, and social studies. A recent study conducted by the US Fish and Wildlife Service found that children in outdoor education settings show improvement in self-esteem, problem solving, and the motivation to learn (2007). Other research shows that time spent in

natural settings significantly reduces symptoms of attention-deficit hyperactivity disorder in children as young as age five (USFWS, 2007). The No Child Left inside Act, which was designed by the United States Congress (2009) for the purpose of seeking to encourage and provide funding for EE, stated that schools that taught core subjects using EE as integrated content also demonstrated reduced discipline and classroom management problems, increased engagement and enthusiasm for learning, and greater student pride and ownership in accomplishments.

In support of Wilson's (1993) earlier research that stated that youngsters in the United States today spend nearly 95% of their time indoors, a recent study conducted by the Fish and Wildlife Service (2007) estimated children today spend a staggering 6.5 hours per day with television, computers, and video games. Indeed, this statistic supports Louv's (2008) notion that kids nowadays are suffering from "nature deficit disorder" (p. 36).

Engaging in EE themes can breathe life into academics, providing the relevance that motivates students to learn (USFWS, 2007). Environmental topics lend themselves to 'hands-on' instruction, an approach to learning that has been shown to have particular appeal to students' diverse learning styles (Wilson, 1993). Many educators believe that environmental studies hold particular promise for improving student achievement in reading and math, with the intent to help improve the academic achievement of all American students, regardless of disadvantages or diverse learning styles (Flanagan, 2006).

Environmental Education Barriers

Due to various perceived barriers, many teachers of school-aged youth have a tendency to avoid teaching EE in schools (Simmons, 1998). Ham and Sewing (1998) categorized barriers to teaching EE in the schools into four themes: a) conceptual barriers stemming from a lack of consensus about the scope and content of EE; b) logistical barriers stemming from perceived lack of time, funding, resources, and suitable class sizes; c) educational barriers stemming from teachers' misgivings about their own competence to conduct EE programs - teachers may not feel comfortable enough to teach EE due to the lack of training and knowledge; and d) attitudinal barriers stemming from teachers' attitudes about EE and science instruction - teachers may feel that EE is too controversial to teach in schools (Ham, S & Sewing D, 1988). A study conducted by Skamp and Bergmann (2001) showed that there is a lack of appreciation by teachers and students for the relationship between EE outcomes and increased performance in core subjects, as well as a lack of priority given to EE within the overall school curriculum.

Skamp and Bergmann (2001) also reported that teachers are timid about leaving the classroom and that taking students outside the classroom involves more than just traditional education considerations of lesson plans, teaching abilities and student behaviors. Teachers believe that classroom management of students outdoors is too difficult and risky with young students. Further, Simmons (1998) states teachers feel that once they step outside the confines of the school, they must worry about the students'

safety, whether due to the presence of other people who are not part of the class who might cause trouble, or other numerous details and variables involved with arranging the trip.

Other studies have indicated that money, time, and lack of resources and knowledge are the three main reasons why EE may not be embraced in our schools (Ham & Sewing, 1998). Perhaps environmental educators can help break down the many barriers toward teaching EE in the schools by providing teachers with resources and curriculum ideas. Teacher trainings and workshops could also provide a viable avenue for teachers to increase their comfort in teaching EE in early childhood programs (Ham & Sewing, 1998; Simmons, 1998). Barnett (2003) states that because turnover is high, basic teacher preparation and professional development, including on-the-job training, must be provided frequently to break down barriers.

In Early Childhood settings, teachers and administrators may face many challenges when trying support young children's experiences with the natural world. Parents and teachers may protest because, when children explore the earth, they get dirt on their clothes, in their hair, and in their mouths (Davis, 1998 & Louv, 2008). Parents may also be afraid to let their kids enjoy nature. Some studies have shown that parents may be afraid to allow their kids to play outdoors (Louv, 2008). Further, Davis (1998) states that many places for exploration have already gone or are fast disappearing from many suburbs due to pollution and other environmental dangers. Parents are becoming afraid to allow their children visit local parks, creeks, and bush lands for fear that

children will step on discarded syringes, be cut by glass, taken by abductors, or knocked down by cars. As for the weather, early childhood teachers may think it is too cold outside or too hot. In cities, there are added concerns about air quality, taking children off-site, traffic, and strangers (Williams, 2008). Another barrier in early childhood EE is time. It takes a great amount of time to get the kids ready to go outdoors. Williams (2008) explains that to provide meaningful outdoor experiences, teachers should plan and organize ahead and schedule enough time into the day to allow for smooth transitions between activities.

Teaching Environmental Education

According to National Education and Environment Partnership (2002), EE is interdisciplinary, which means it is easily integrated into all subject areas and classroom curricula. Additionally, Benson & Miller (2008) support the notion that teaching EE and experiencing nature is a viable way to meet state and national standards for EE. Nature exploration allows children to develop many skills later in life (Wilson, 1996). Social collaborations in nature help promote the practice of students' communication and relational skills by sharing their findings and building relationships with others. As the children observe and discover, they learn new vocabulary skills and learn to express their emotions (Basile &White, 2000). Both large motor and fine motor skills are used in outdoor nature experiences, whether it is leaping across a brook, climbing trees, or picking up rocks off the ground. The outdoors provides a useful setting for teachers to support their already existing classroom curricula, as well as to foster new learning

opportunities (Benson & Miller, 2008). In an early childhood developmentally appropriate curriculum, Bredekamp and Carol (1997) state that young children are mentally active learners who are always taking part in constructing their knowledge or understanding of the world. Children learn best when they are actively involved. As they play, explore, experiment, and interact with people and objects, children are always trying to make sense of the world around them (Bredekamp & Carol, 2006).

According to the US Fish and Wildlife Services (2008), EE provides another avenue to nurture positive relationships between the school and the community. For example, preschools often strive to get the community involved in their educational programs, and may do so, for example, by hosting a community clean up. Another way may be to invite the community to listen to special guests talk about a community garden or recycling program initiative. In early childhood developmentally appropriate programs, children learn through experiences with their families and communities (Bredekamp and Carol, 1997).

Similar to other academic subjects, Hungerford, Peyton, & Wilke (1980) state that EE should be taught sequentially and at different levels or stages over a period of years. Gilbertson, Bates, McLaughlin, & Ewert (2006) outline four stages for teaching EE. They are: a) sensory awareness; b) skills development and training; c) relationships (ecological); and d) environmental issues awareness and action.

Sensory awareness helps students feel less anxious and overcome some of their preconceived fears (Gilbertson K., Bates T., McLaughlin T., & Ewert A., 2006). Students

learn to use their senses to become aware of and appreciate their natural surroundings. Children as young as infants can benefit from bringing nature into the classroom, and by going outdoors. Teachers can cultivate nature investigations with very young children by offering infants natural objects they can explore and investigate (Buerk & McHenry, 2008). Seefeldt (2005) states even the youngest of children observe, listen, feel, taste, and take apart while exploring everything in their environment. Learning to appreciate and enjoy nature leads to developing nature skills later in life (Davis, 1998). Skills development can be anything from practicing a specific sport such as cross-country skiing to learning general skills such as camping and using a pair of binoculars. The students' relationships to their surroundings and awareness of relationships with nature will begin to develop when they are able to move comfortably in their learning settings (Wilson, 1993). Sobel (1996) states that students need to learn to build connections and learn to understand ecological relationships. The next stage, environmental issues, is where students use their understanding of relationships between human beings and nature to help to identify environmental issues and take action to resolve the issues (Gilbertson, Bates, McLaughlin, & Ewert, 2006).

According to Basile (2000), learning is an ongoing process throughout one's life. One must gain awareness and knowledge about the environment before one can try to save it (Sobel, 1996). That is why EE is taught in sequenced stages. Sequenced stages of learning allow teachers to reinforce knowledge that students have previously learned in

their life experiences over time (Basile, 2000). Stages are an important part of EE and we must continue through all the stages throughout students' lifetimes and education.

Aside from those who have focused on the enhancement of traditional core academic subjects in the schools, Sobel (1996) also explains that EE in early childhood years falls under the category of sensory awareness and appreciation of nature. Young children often develop an emotional attachment to what is familiar and comfortable to them (Wilson, 1996). If they are to develop a sense of connectedness with the natural world, they need frequent positive experiences with the outdoors. Children need to build a relationship and appreciate nature before we can ask them to deal with heavily weighted environmental issues (Sobel, 1996). It is important that children have an opportunity to bond with the natural world and learn to love it before being asked to heal its wounds (Sobel, 1996). Though many have shown various ways that EE is being taught in schools (e.g. see Davis, 1998; Louv, 2008; & Wilson 1993 & 1995), only a small few (Davis, 1998 & Wilson, 1995) have discussed curriculum guides on teaching EE to young children. Hence, there is a gap in the research conducted to date on methods and activities used in EE for the Early Childhood levels.

Integrating Environmental Education in the Classroom

In addition to outdoor experiences with nature, children should be given opportunities to enjoy nature inside the classroom (Wilson, 1995). Integrating EE into the classroom has been shown to be one effective way of delivering nature based education lessons (Wilson, 1993). Preschool classrooms have ample amounts of free choice or

discovery time during which these types of lessons could be implemented. Preschool classrooms also often have different learning centers or stations such as dramatic play, block center, science center, sensory table, and literacy corner; providing yet another opportunity to create a lesson space for EE concepts. Isbell (1995) indicates that young children are active learners who touch, feel, experiment, and create. The effective learning center is designed to relate to the world of active learners, and is planned to encourage their involvement. Young children are naturally interested in the world in which they live; and centers are symbolic representations of their world (Isbell, 1995). Louv (2008) suggests that it takes a relaxed learning atmosphere coupled with semi-structured playtime for children to experience nature in a meaningful way. Equipping children with the power to use tools, observe with intent, and create their own theories about their observations encourages childrens' openness to the wonder and joy of nature (Louv, 2008). By integrating nature based lessons and EE into the curriculum, both indoors and out, children have greater opportunities to discover the magical aspects of nature.

Wilson (1995) suggests guidelines for integrating EE into the preschool classroom. First, she notes the importance of adding nature-related materials to each learning center. Nature-related items can easily be incorporated into each center, and may include, for example, dried grasses, leaves, pinecones, and other nature materials in the art center. Other examples might include audio or compact discs with sounds of or about nature incorporated into a listening station. Nature puzzles, shells with holes for

stringing, and lotto cards with nature-related photos all are items that could be incorporated into a small manipulative center. Animal costumes and dens, camping equipment, child-sized gardening tools, and realistic animal puppets could be added into a dramatic play center. A literacy station could be designed with books about nature, and flannel-board animal characters.

Second, Wilson (1995) suggests that it may be motivating to keep animals and plants in the classroom. Animals and plants can help children develop a sense of responsibility towards living things. Third, Wilson (1995) recommends sharing pro-nature books and stories with children. Nature books or stories provide children with positive messages about the natural world. However, not all stories may be appropriate. For example, certain selections may portray various animals as mean creatures, thereby frightening children and creating negative feelings about nature. Fourth, Wilson (1995) suggests using materials from and about the natural world to decorate the classroom. Natural materials such as branches, shells, and baskets of fruits and vegetables can add interesting and aesthetic value to the classroom and help children learn about the natural world.

In addition to integrating nature into the classroom, it may also be valuable for early childhood programs to get parents involved (Wilson, 1993). Preschool aged youth spend most of their day at home with their parents when they are not a school. This means that parents may have an ideal opportunity to nurture key aspects of environmental education in and around the home. However, it is important to realize that parents also

may experience some of the barriers to incorporating EE activities into daily routines reported by teachers (Davis, 1998). To alleviate some of the difficulties parents may need to overcome, schools can help teach parents nature activities and EE through parent classes, newsletters, send home activities for both child and parents, and getting them involved in the classroom. When parents and schools work together, EE activities and lessons can be a very easy way to get the whole family and community together enjoying nature (Davis, 1998).

In summary, EE benefits the child as well as the natural world around us (Davis, 1998, Louv, 2008; & Wilson, 1992). Many researchers have discovered that teaching young children EE is an important part of children's physical development as well as their emotional development. Environmental educators try to break barriers and get EE in our schools. They feel that the younger they start teaching EE the more likely those children will foster positive attitudes towards the natural environment. EE is interdisciplinary, and allows for different teaching styles. EE and early childhood education are easily integrated into a curriculum. Both EE and early childhood education curriculums focus on using different learning styles and hands-on exploration. EE's nature experiences in classrooms also help meet early learning standards. There is much literature and research about the importance and goals of EE curricula for early childhood levels (Buerk & McHenry, 2008; Davis, 1998; Wilson, 1993 &1995). However, there are very few curriculum books or guides on environmental curriculum for that age level. My curriculum project integrates nature activities in the classroom with quality outdoor

experiences. My curriculum project will provide a sound environmental curriculum for the early childhood level. The outdoors gives teachers a perfect tool and setting to teach.

CHAPTER THREE

PROCEDURES

The purpose of this curriculum is to provide an early childhood nature curriculum with both indoor and outdoor experiences for Happy Time Day Care Center of Duluth, Minnesota. This curriculum will provide the students positive outdoor experiences that focus on nature awareness and appreciation. The indoor nature experiences will be integrated into different learning centers as well as some large group activities.

Conditions

Happy Time Day Care Center, an accredited preschool and childcare center located in the Lincoln Park neighborhood in West Duluth, provides quality care for infants through age five children. The professionally trained staff collaborates with parents and community members to provide a safe, nurturing environment where children thrive during their first five years of life.

Delores Anderson founded Happy Time Day Care Center in 1969. Since their beginning, Happy Time has provided safe, healthy, and nurturing experiences for children and families. Happy Time's motto is “preparation for kindergarten, foundation for life” (Happy Time Day Care Center, n.d.). At Happy Time, children are taught a variety of ways to express themselves and to share what they have learned. Happy Time

staff members believe that all children are thinkers, researchers, and problem solvers. Happy Time teaches children how to learn how to ask questions, seek answers, and attach meaning to discoveries. Happy Time Day Care is located one block away from Lincoln Park. The park is a marvelous place for children and provides endless opportunities for playing, exploring, and learning about nature. Happy Time provides early childhood education for children from Duluth, Proctor, Hermantown, Esko, Carlton, and Cloquet, Minnesota, as well as from Superior, Wisconsin. Happy Time's racial and ethnic make up is 0% American Indian or Alaskan Native; 2% Asian; 12.99% African-American; 1.1% Hispanic; and 87% Caucasian.

A key component of Happy Time's ability to deliver quality programs that meet the needs of young children is their philosophy. Happy Time is committed to supporting and nurturing all children as thinkers, researchers, and problem solvers during their journey of learning and life. They believe all children are unique learners, and they teach them to learn and express their understanding in multiple ways. Additionally, Happy Time engages in a strong partnership with parents. The professional staff at Happy Time respect that the parent/s is/are the child's first teacher/s, and parents must be included in all decisions about the child's growth and development. Open dialogue and daily communication with parents is essential for the healthy development of the child. Happy Time hires a well-qualified staff of teachers and assistants that provide a rich and loving environment for children while setting consistent and appropriate expectations and limits. Each of their staff has either a degree in Early Childhood Education or significant

experience in the area of early childhood education. Happy Time wants their staff to view themselves as learners and continue to gain understanding and knowledge through professional development. The staff is required to participate in forty hours per year of continuing education.

In accordance with theoretical models of child development such as Bronfenbrenner's (1998) Ecological System's Theory, (http://www.happytimedaycare.com/index.html) (Figure 1), Happy Time Day Care Center believes that the relationship between communities, parents, and staff help strengthen the development of each child. According to Brofenbrenner (1998) the processes entailed in Ecological Systems Theory of Child development take place through processes of interaction between an active child and the persons, objects, and symbols in his/her immediate environment, such as the school and community. (Bronfenbrenner, 1998, p. 996)

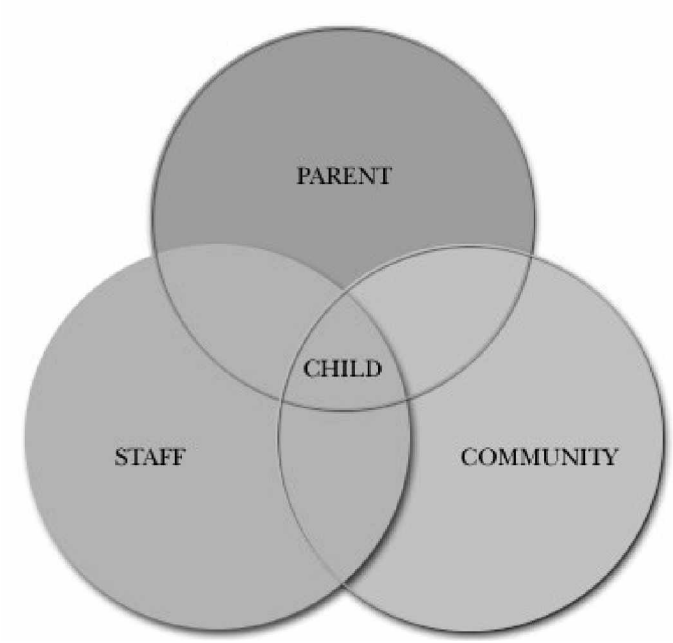

Figure 1. Child Development Theory Model
(http://www.happytimedaycare.com/index.html, n.d)

Subject Selection

This curriculum is designed for preschool aged youth, which tend to be between the ages of three and five years (Isbell, 1999). More specifically, this curriculum was designed for the combined preschool classroom at Happy Time Day Care Center in Duluth, Minnesota, which has a mix of two and a half year olds to five year olds and three team teachers. There are two classrooms; one classroom for the older preschoolers and one for younger preschoolers. Each classroom consists of a head teacher and an assistant teacher. Both classroom teachers collaborate during lessons and activities, as the lessons are designed in such a way that they share the same themes. The lessons are constructed on the foundational information that in the realm of EE and early childhood education children learn by interacting with the natural environment (Wilson, 1993).

Young children like to play, explore, experiment, and interact with people and the world around them (Bredekamp & Copple, 2006).

Curriculum Design

Through an investigative search pertaining to the needs of various preschool programs in the Duluth, Minnesota area, it was concluded that Happy Time Day Care Center was in search of a professional or pre-professional to develop a nature based EE curriculum for their students' ages two and a half to five years. A series of meetings with Happy Time staff and parents were held spring semester 2010 during which all stages of the planning process for their new nature based curriculum took place. During the initial two meetings, a needs assessment with the staff, site Director, and parents took place that included interview questions addressing the types of lessons they would like to see offered in EE at Happy Time. Based on this needs assessment it was decided by Happy Time Staff that a full scale remodeling of the Happy Time facility would take place during the next year in order to fully support the interests and subject matter of a new nature based curriculum. After three meetings, the vision for the curriculum was established. To accommodate the vision set forth by the parents and staff of Happy Time Day Care Center, a well-developed early childhood nature curriculum was created, including the development of twelve lessons with corresponding newsletters, teacher trainings, and a training manual.

Development of Lesson Plans

The lessons in this curriculum were designed using NAEYC's DAP framework. DAP is a well-known framework that is widely used by early childhood programs to guide the development of their curricula (Bredekamp & Carol, 1997). DAP is based on the knowledge of individual children and the various contexts within which they develop and learn. Each child develops at different rates and each has different learning styles. DAP curriculum consists of challenging and achievable goals that contribute to ongoing development and learning of the individual child (Bredekamp & Copple, 2006).

Treatment

Twelve lessons plans were developed, one lesson for each month of the year. Each lesson is learning center based and developmentally and age appropriate, while focusing on nature appreciation and sensory awareness. Each lesson has one main theme that will be incorporated into the different learning centers. Lessons include experiences that will allow students to learn both indoors and outdoors.

The twelve themes are:

1) *Winter Wonderland* is about snow and ice discovery.

2) *Whose been in the Woods* focusing on signs of animals such as tracks and scat.

3) *The Melt Down* focusing on what happens to the snow and ice when the weather gets warmer.

4) *Fun in the Mud* is about discovering mud.

5) *Spring has Sprung* is about flowers and trees.

6) *Feathered Friends* is about birds from the Duluth area.

7) *Over the River* is about discovering the river that is a block away from Happy Time.

8) *Nature Sense* is about using your five senses in nature.

9) *The Great Lake* focuses on Lake Superior and its wildlife and waves.

10) *Fall into Autumn* focuses on the seasonal changes in autumn.

11) *Whose Home is this?* This lesson is about focusing on animal homes.

12) *A Long Winter's Nap* focuses on winter adaptations and animals that hibernate in the winter.

The curriculum is aligned with the Minnesota Early Learning Standards and NAEYC Early Childhood Program Standards. Minnesota Early Learning Standards are guidelines for teachers and providers to help them plan thoughtfully designed daily curricula, instruction, and ongoing assessment for meeting children's individual needs (Minnesota Department of Education, 2005). NAEYC Early Childhood Program Standards ensure the quality of children's daily experiences in early childhood programs and promote positive child outcomes (NAEYC, 1926). The curriculum is also aligned with the National Education Science Standards. The National Education Science Standards are designed to guide our nation toward a scientifically literate society (National Resource Council, 1996).

Needs Assessment

Engelson (1985) recommends surveying teachers to find out what their feelings are towards EE. In order to determine what work needs to be done to develop and implement a nature-based EE curriculum at Happy Time in Duluth, Minnesota, a needs

assessment was conducted at the center with parents, teachers, and staff. The Director and teachers completed an informal questionnaire and interview on what EE means to them and what their barriers and fears are in teaching EE in their classrooms. The completion of the needs assessment ensured that this curriculum meets the current needs of the teachers and parents at Happy Time. The needs assessment was used in the development of the lesson plans and the conduction of teacher training.

Parent Involvement

A developmentally appropriate curriculum includes a relationship between families and schools (Bredekamp & Copple, 1997). Parents are the most important people in their children's lives and know their child's interests and preferences (Bredekamp & Copple, 2006). Preschool aged youth spend most of their day at home with their parents when they are not at school. Therefore, parents have an ideal opportunity to nurture key aspects of EE in and around the home (Davis, 1998).

Happy Time's parents were invited to help participate in a parent/teacher meeting in the development of this curriculum. The parents were given opportunities to give feedback as well as ask questions about the nature curriculum. Parents will be informed about the curriculum through monthly newsletters that correspond with each lesson. The newsletter will give suggestions on ways to incorporate EE in their homes as well as provide outdoor resources and descriptions of activities in their region.

Teacher Training

Ham and Sewing (1998) state that an environmental program should provide training on using the classroom and the schoolyard as sites for EE. Thoroughly training staff in EE not only breaks down barriers, but also meets Minnesota's standards of effective practices. Teachers need to know the subject matter, EE teaching strategies, and the learning environment in order to be effective. Minnesota provides these standards as a comprehensive overview of what new teachers should know and be able to do. Minnesota has ten standards of effective practices to help teachers prepare for instruction. The standards are: 1) Subject matter: A teacher must understand the central concepts, tools of inquiry, and structures of the disciplines taught and be able to create learning experiences that make these aspects of subject matter meaningful for students; 2) Student learning: A teacher must understand how students learn and develop and must provide learning opportunities that support a student's intellectual, social, and personal development; 3) Diverse learners: A teacher must understand how students differ in their approaches to learning and create instructional opportunities that are adapted to students with diverse backgrounds and exceptionalities; 4) Instructional strategies: A teacher must understand and use a variety of instructional strategies to encourage student development of critical thinking, problem solving, and performance skills; 5) Learning environment: A teacher must be able to use an understanding of individual and group motivation and behavior to create learning environments that encourage positive social interaction, active engagement in learning, and self-motivation; 6) Communication: A teacher must be able to use knowledge of effective verbal, nonverbal, and media communication techniques to

foster active inquiry, collaboration, and supportive interaction in the classroom; 7) Planning instruction: A teacher must be able to plan and manage instruction based upon knowledge of subject matter, students, the community, and curriculum goals; 8) Assessment: A teacher must understand and be able to use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student; 9) Reflection and professional development: A teacher must be a reflective practitioner, who continually evaluates the effects of choices and actions on others, including the students, parents, and other professionals in the learning community, and who actively seeks out opportunities for professional growth; and 10) Collaboration, ethics, and relationships: A teacher must be able to communicate and interact with parents or guardians, families, school colleagues, and the community to support student learning and well-being (Minnesota Office of the Revisor of Statutes, 2010).

Teachers at Happy Time may not have adequate background training in EE and therefore a teacher training was conducted to help teachers understand the theories and concepts of each lesson. The training met Minnesota's Standards of Effective Practices. Training consisted of multiple one-hour sessions during which EE practices and theories, and each monthly lesson were reviewed. Training also served as a test run and allowed teachers to try-out the lessons to help reduce anxiety of teaching a new curriculum. A manual was added to the curriculum so future staff at Happy Time will be able to understand how to use the curriculum properly (Appendix F).

Outcome Measures

Evaluation of the nature based EE curriculum at Happy Time takes place in three stages. Within each of the lesson plans, there is an assessment component teachers may use to determine whether the students met the lesson plan objectives. As the early childhood educators make decisions about what to teach, how to modify lesson plans, and how to best build on children's strengths and respond to their needs as they arise in the classroom, teachers are encouraged to take reflective notes on the success of each lesson experience in the curriculum. The third stage happens over three years. The first year consists of teaching the curriculum and taking reflective notes on each lesson. During the second year, teachers should use their reflective notes from the first year to determine if the curriculum is meeting the needs of the staff, parents, and children of Happy Time. At the end of the third year, an evaluation of the overall curriculum process needs to be conducted to see if anything significant needs to be changed. Subsequently, any needed global changes to the curriculum can be made to accommodate identified needs from the evaluation process.

Evaluation

The assessment tools implemented by the Happy Time teachers in the 12 lessons may be used to assess both the individual students and the classroom as a whole. Some examples of possible assessments that are written in the lesson plans include portfolios, drawings, rubrics, discussions, Know-Want to learn-Learn Charts (K-W-L), concept maps, and teacher/parent observations. Portfolios are collections of the student's work

and progress over time. A rubric is an evaluation tool consisting of criteria, a measurement scale, and descriptions of the characteristics for each score point. K-W-L Charts illustrates what the students already know about the concept, what they want to learn, and what they learned after the lessons. A concept map is a diagram that links relationships between concepts of a subject. Collecting student's drawings before and after a lesson is a way to see if there has been an increase in knowledge. (McTighe & O'Connor, 2005)

The Happy Time Director and staff had the opportunity to review and discuss each lesson during our teacher training at the beginning of March 2010. The teachers conducted a pilot test of the curriculum during April 2010. During the pilot test stage, the teachers at Happy Time had the opportunity to teach one lesson throughout the month, reflect on the lesson, and then provide feedback on how to improve the lesson. Based on the feedback, lessons were revised as needed.

CHAPTER FOUR

RESULTS

The purpose of this project was to develop a nature curriculum for the preschool program at Happy Time Daycare of Duluth, Minnesota. The steps taken to complete this project included conducting an informal needs assessment of the staff at Happy Time Daycare, developing the curriculum, conducting a parent teacher meeting about the purpose of the curriculum, developing a training manual for parents, teachers, and staff, training the Happy Time preschool teachers before each lesson, and conducting a pilot test of one lesson. The results of this project follow.

Needs Assessment Results

A needs assessment (Appendix A) was conducted in January 2010 to find out how comfortable teachers are teaching about nature and teaching in the outdoor setting on a scale of one to five, five being the most comfortable, and one being least comfortable. All four teachers wrote down a four. They all stated that they are all comfortable teaching outdoors and that they enjoy being outside with the kids and teaching with nature. At the time of this assessment, they were looking forward to this curriculum being hands-on as a means to foster exploration. The only thing they were afraid of was they felt they might not be able to answer all questions that may arise during the nature lessons. I stated in my training that to teach EE, one does not have to have all the answers but only needs to be able to investigate where to find them; and teaching the preschoolers to find the answers is just as valuable. During the needs assessment the teachers were asked to describe EE. All teachers stated that EE is learning about nature and getting involved in nature. One teacher also wrote that EE is learning what happens in nature. The needs assessment questioned the teachers about what they thought are the benefits of having a nature curriculum, as well as the potential positive impact that being in the natural environment may have on their students. Three out of the four teachers wrote that the students will become interested in nature and that they will learn to care about the natural world. One teacher stated that she was hoping that bringing nature inside the classroom would bring more "aha" moments to students' learning and bring a calming effect into the classroom. The last question addressed nature topics or themes the teachers were interested in

implementing into their day care. Desired lesson topics identified by the teachers in the questionnaire included mud, river, water flow, rocks, and plants. I used these topics to create some of the themes in my curriculum.

Curriculum Development Results

The Early Childhood Nature Curriculum for Happy Time Day Care is composed of twelve lessons, one for each month of the year. The objectives and concepts for each lesson are aligned with Minnesota Early Learning Standards (2005), NAEYC Early Childhood Program Standards (1926), and the National Education Science Standards (1996). These standards are listed in each lesson plan. Each lesson also has an evaluation section that helps teachers assess the knowledge of the students as well as to determine whether the lesson plan objectives were met.

Each individual monthly lesson has its own theme that emphasizes nature appreciation and sensory awareness with activities designed for positive interactions with the environment. Each lesson consists of outdoor experiences as well as integrating nature into the indoor environment. The indoor nature experiences are integrated into learning centers throughout the daycare. Indoor lesson plans consist of at least five different learning centers and two large group activities.

The curriculum has a monthly newsletter that corresponds with each monthly lesson. These newsletters are designed to keep parents aware of what is going on in the curriculum. Each newsletter describes the theme for the month as well as some of the activities being taught. Activities that parents can do at home with their children are also

described. Each newsletter contains a fun nature fact, a finger play, and a Duluth resource geared toward families' learning about nature. The newsletters distributed at the beginning of each month into each preschooler's mailbox.

Samples of the lesson plan and newsletter templates are included for teacher information (Appendix B). Also included in the curriculum is a complete list of all the materials needed to make the curriculum functional (Appendix C), as well as final versions of the lesson plans and newsletters for teachers use (Appendixes D and E).

Teacher Training Results

Trainings and meetings were conducted three times during March and April 2010. Each training session lasted approximately one hour and was conducted during the preschoolers' naptime. During these training sessions, the lesson plans and newsletters were reviewed and discussed by the preschool teachers at Happy Time. The teachers had opportunities to ask questions about individual activities, materials, and teaching styles. They also used this time to discuss, as a staff, how each lesson would be taught and where they would locate materials for the lessons. In addition to reviewing the lessons, teachers received a handout that included a description of EE, ways to teach it, and supporting literature on why nature discovery is important for this age level.

Teacher Training Manual

Staff training must be provided frequently because turnover is high in the Early Childhood profession (Barnett, 2003). The teacher training manual (Appendix F) was developed in hopes that the Happy Time Center Director would continue to train her new

staff to use this nature curriculum in years to come. The manual describes the purpose as well as the significance of the using the curriculum. Wilson's (1996) seven guidelines for developing and implementing an EE program for preschool-aged children are also included in the manual. The manual explains the purpose statement for each monthly lesson.

Parent Teacher Meeting

A parent teacher meeting was held at the end of April, 2010. At this meeting, the parents were informed about the curriculum project. They received a handout that explains the purpose of the curriculum, the monthly themes, and literature that supports the nature curriculum project. Parents had the opportunity to ask questions and give feedback. Only four mothers were in attendance at the parent teacher meeting as well as the head preschool teacher. This meeting was also an informational meeting about the upcoming nature playscape that is being built on the playground. During the meeting, several positive comments were made about the curriculum. For example, one mother stated, "my child usually does not talk about the school day, but now he is excited to explain all the fun he has had with mud this month!" In agreement, another mother at the meeting said, "My child prefers to go to parks instead of the movies now." The parents who attended the parent meetings were excited about the curriculum and newsletters. One parent stated that she enjoys the newsletters because she knows what is going on in school and can work on the same things at home.

Pilot Test Results

While not all twelve lessons could be implemented during the pilot test phase of this project, the staff at Happy Time was asked to pilot test the "Fun in the Mud" lesson for the month of April 2010. Due to the lack of rain during April 2010 in the Duluth, Minnesota area, the staff at Happy Time had to be creative in the process of designing outdoor mud experiences for the lessons. Specifically, this involved the staff at Happy Time using a garden hose in the dirt to create an area of mud on the playground for the children to explore during various phases of the lessons.

The Director stated that this curriculum and the pilot lesson caused her staff to work together and become more creative. She also stated that she noticed her staff are more excited and are having just as much fun teaching as the kids are learning. Teachers stated that the preschoolers are exploring more and using less of the playground equipment at the park. They are using descriptive words such as "squashy", "slippery", "wet", and "mushy". The preschoolers are also being more creative and using their imaginations. One child was making mud soup while singing a personally made-up mud song. Using sticks, other students were comparing the depth of the mud while others were creating their own mudslides with water and dirt. The teachers at the center took the lesson and extended it with their own ideas. These extended lessons were based on the students' interests and questions they developed. Overall the teachers and Directors are excited to use the rest of my curriculum over the course of the coming school year and to add it to their annual curriculum.

CHAPTER FIVE

SUMMARY

The final product of this project is the early childhood nature curriculum that includes twelve preschool lesson plans and their corresponding newsletters for Happy Time Day Care Center of Duluth, Minnesota. This curriculum is unique in that it is aligned with Minnesota Early Learning Standards, NAEYC Early Childhood Program Standards, and the National Education Science Standards, with both indoor and outdoor nature experiences. The indoor nature experiences are integrated into learning centers throughout the preschool classroom. The curriculum was created with the intention for

use by Happy Time Day Care Center, however many of the lessons could easily be adapted for the use at other early childhood centers. Another unique aspect of this curriculum is that it incorporates teacher and parent input as well as training sessions to support the lesson plans.

The Happy Time Day Care Center's Director communicated the need for this curriculum as a practical tool. The goal of this project is for Happy Time Day Care Center and its staff to use this curriculum regularly throughout the year and for the students to develop sensory awareness and nature appreciation. Additionally, according to Davis (1998), this curriculum fills a gap in the EE literature for development and design of nature based curricula specifically geared toward preschool-aged youth ages three through five. This curriculum meets both regional and global early childhood EE curricula needs.

Curriculum Benefits

During the pilot test phase of designing this curriculum, it was noted that this curriculum will be beneficial to Happy Time Day Care in numerous ways. Each lesson is focused on one theme that is integrated throughout the learning centers of the preschool classroom. This approach was reported by teachers and staff to be interesting because the preschoolers learn one concept at a time while employing many different learning styles. For instance, the lesson they pilot tested "Fun in the Mud", had the preschoolers measuring mud for math, writing about the mud for writing, mixing dirt and water to make mud for science, and sliding in the mud for large motor skills.

After the pilot test, the teachers stated that they noticed the students have spent more time looking at nature rather than spending time on the playground equipment in the park. One teacher happily said, “The kids do not want to come in from outside; they are very excited to be in nature and at the park”. Another teacher stated that, “The kids are like little scientists coming up with ways to explore the mud”. One parent added that, “My son would rather spend time outside instead of going to a movie”. The Director also stated, “The preschoolers come in from outside with exciting stories about mud”. Hence, it appears that the children’s behaviors and attitudes towards the environment are changing and have been sparked by the curriculum.

This curriculum has not only been beneficial to the students but to the staff as well. The Director stated, “The curriculum has helped the staff become more creative and work as a team instead of individual teachers.” She also noticed her teachers are having fun and are excited to teach, and described it as a sense of free energy in the school. The teachers described free energy as “a feeling of more liveliness in the school.”

Pilot Lesson

During the “Fun in the Mud” lesson that was used as the pilot lesson for the curriculum, the teachers at Happy Time Day Care Center used anecdotal records to track the student’s learning process. Each teacher carried a small notebook and wrote down what they observed during the participation of their preschoolers. Some of the field notes shared by teachers included one girl using the story “Muddigush” to create her own “Muddigush” soup while singing a song. Two boys spent an hour comparing the depth of

different puddles of mud with sticks. These boys used words, such as “This mud is deep”, “This one is deeper”, and “There is a lot of mud”. Three students developed their own mud puddle by carrying water from the stream to a dry patch of dirt. Many students used new vocabulary words to describe mud such as “slippery, mushy, slimy, squashy, and slushy”. Several children invented a mudslide by sliding on the mud with their boots, and they spent an hour sliding down the hill and climbing back up. One child was expressing her feelings towards mud by saying, “At first I thought it was gross and yucky, but now I enjoy it”.

During the month of April, the teachers also conducted several meetings during which concept webs were developed that showed the linkages of knowledge and concepts preschoolers have about mud. The teachers used these concept maps to compare them to similar concept webs from other subjects taught to determine if the preschoolers seemed to be learning any new concepts and knowledge about mud. Based on the previous field notes, it was evident that the teachers and staff alike agreed that new learning had taken place during the pilot lesson.

Staff Training Manual

As a supplement to the lesson plans and newsletters, a training manual was developed for the curriculum so that teachers and staff would have a viable resource to help guide them through the process of implementing the lessons. Additionally, because teacher turnover in the pre-school and day care industries is quite high, the training manual was also produced to serve as a way for new and future generations of staff to

keep the curriculum alive and thriving. The manual also supplies EE resources pertaining to the northland region, a guide to finding online EE websites, and Wilson's (1996) guidelines for developing and implementing an EE program for preschool-aged children. These guidelines explain how to bring EE into your center as well as how to teach it. The goal of this manual is to help keep the nature curriculum a regular part of Happy Time's Day Care Center's curriculum.

During the time that this curriculum was developed, Happy Time Day Care conducted weekly teacher/staff meetings for one hour during the children's naptime. The meetings served as a platform for the teacher's review and prepare for the next week's lessons, the new curriculum in general, and to communicate any concerns about the center. These meetings provided the Director many opportunities to use the training manual to train new staff and refresh the experienced staff on how best to use the curriculum.

Future Direction and Research

To the best of my knowledge, this curriculum is the only early childhood nature curriculum of its type being implemented in the Duluth, Minnesota area. This curriculum was created with the underlying goal that through its use professionals in EE will be able to gain valuable knowledge about how to deliver this important content to preschool aged youth. It is anticipated that the existence of this curriculum may have the potential to inspire other researchers and professionals to join in the movement toward all young children having the opportunity to experience quality EE in their respective school

settings. Much research is still needed to inquire about the ways parents can become more involved in EE at home; to help teachers and staff find practical and economical solutions to overcoming perceived barriers to delivering EE lessons; and to begin to undo the detrimental effects of "nature deficit disorder" (Louv, 2008).

In accordance with this nature curriculum, Happy Time Day Care Center has launched their initiative to revitalize and remodel the inside of the center as well as the "playscape" in their playground. The full remodeling and painting of the interior of the center took place while this curriculum was being developed and included manufacturing a setting where the various learning centers could easily be situated. Additionally, a very realistic looking, miniature sized, log cabin for the children to play in was also introduced into the middle of the classroom. On the outside of the center decrepit playground equipment is being removed and replaced by tree stumps for analyzing and climbing, sand pits for digging and creating, and areas of natural gardening; all designed to enhance the children's access to more natural forms of leisure space.

Conclusion

This curriculum was created to provide children with positive experiences with nature both indoors and outdoors that are both developmentally and age appropriate. These experiences should focus on nature appreciation and sensory awareness. This curriculum provides opportunities to engage in EE lessons that focus on interactive, natural experiences.

As a result of their participation in various trainings and meetings regarding the use of this curriculum, the staff at Happy Time Day Care Center reported being comfortable with each lesson plan and stated that they are excited to teach their preschoolers about the joy of nature. I believe that this curriculum is a step in the right direction toward teaching children to embrace nature and the environment at a young and critical age so that they can later become agents of positive change with regard to the enjoyment and protection of our natural resources.

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APPENDIX A

NEEDS ASSESSMENT QUESTIONAIRE

Happy Time Teacher Questionnaire

What does environmental education mean to you?

What are your thoughts about environmental education?

In a scale of 1-5 (1: not comfortable and 5: most comfortable), how comfortable are you teaching environmental education? (If you answered 1-3 got to question A and if you answered 4-5 question B)

What are some reasons that make you uncomfortable in teaching about nature? What are some ways I can help you overcome those reasons?

In what ways are you comfortable teaching kids about nature?

What effect will bringing nature into the classroom have on your students and you as teacher?

What are your ideas on ways to incorporate nature into your classrooms?

APPENDIX B

TEMPLATES OF LESSON PLANS AND NEWSLETTERS

Lesson Plan

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards

Objectives:

Concepts:

Skills:

Key Words:

Learning Centers:

Learning Center:	**Preparation:**	**Activity:**
T eacher-Directed		
Writing		
Sensory Table:		
Science Center:		
Math		

Large Group Activities:

Intro:

Day 1:

Materials:

Day 2:

Materials:

Conclusion:

Nature News

Monthly Nature Lesson

Other Classroom Links:

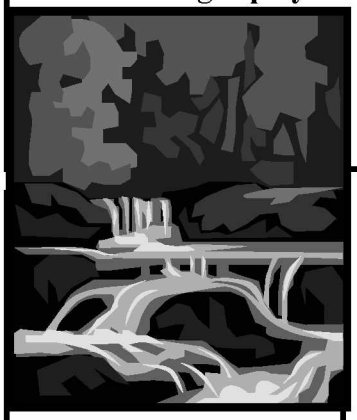
Questions for Discussion:

Finger Play:

Taking It Further:
(Home Connection)

Evaluation:

Finger plays:



Interesting Nature Fact:

APPENDIX C

LIST OF MATERIALS

Materials List for Lesson Plans

Non-Natural Materials:

- Binoculars
- Outdoor thermometers
- Thermometers
- Magnify glass
- Pans
- Bowls
- Scoops
- Shovels

Food coloring
Spray bottle
Large paper for graphs
Measuring stick
Laminated silver wrapping paper or Aluminum paper
Freezer
Ice Cube Trays
Ceramic animal paws
Plaster of Paris

- 3 cake pans (big enough for child's foot)
- Animal Tracks Field Guide
- Large poster paper/chalk board/white board to make predictions
- Plastic containers
- Bowls
- Muffin tins
- Rag to clean hands
- Garden tools
- Toilet Paper/Paper Towel rolls
- Watering can
- Plastic Trays
- Plastic Wrap
- String
- Butter knife
- Eyedropper
- Plastic bottle
- Plastic drop cloth or tarp
- Black cloth
- Blue Cloth
- Buckets
- Pitcher
- Clip Boards
- Film Containers
- Bag or pail
- Blindfolds
- Different tools (tweezers, pinchers, pliers, etc..) that represent beaks
- Toothpicks
- Water Glass
- Plastic bags
- Paper plates
- Kleenex box
- Ribbon for a bow
- Nutcracker
- Mini Rakes
- Crisco
- Baggies
- Plastic gloves

Supplied in Lesson Plans

- Light houses, boats, ships, and photos of bridges
- Photos of animals in and around Lake Superior
  Photos of animals
- Photos of animal tracks Photos of bridges
  Photos of boats/ships
  Photos of waves
- Nature Journals
  Plant life cycle sequencing cards
- Nature sounds CD's: water, birds, rain, storms, etc...
- Bird Sounds CD
- Little paper cut-outs of animals who hibernate
- Photos of waves on Lake Superior
- Habitat Sort Photos (animals and their homes)
- Waves CD

Plastic Animals and Puppets

- Plastic toy bats, and spiders
- Plastic woodland animals
- Plastic toy bats
- Plastic toy boats, ships, lighthouses, fish, and bridges
- Fish, turtle, seagull and other animal puppets

Technology

- CD player
- Headphones

- Camera
- Stop Watch

Art Supplies

- Paint
- Paint Brushes
  Markers
- Crayons,
  Construction paper
  White paper
  Glue
- Pencils
- Brown tempera paint
- brown play dough
- Black construction paper or felt

Natural Materials that needs to be purchase and Food:

- Minnows
- Potato
- Bird Seed
- White carnation
- Coffee grounds
- Peanut butter *Peanut allergy- use shortening or lard
- Wild onions
- Berries
- Mint leaves
- Fruits
- Seeds to plant
- Potting soil

Natural Materials:

- Snow
- Ice
- Water
- Icicle
- Dirt
- Soil
- Mud
- Sand
- Sticks
- Branches
- Leaves
- Pinecones
- Pine needles
- Acorns
  Moss
- Fresh pine needles
- Feathers (different kinds, sizes, colors)
- Fist-Sized Rocks
- Rocks from the river
- Various rocks from Lake Superior
- Lake Superior Agate
- Bark
- Furs
- Grass
- Weeds
- Flowers
- Shells from Lake Superior
- Snail shells
- Bird's nest
- Bee hive
- Natural earth clay

APPENDIX D

LESSON PLANS

Lesson Plan
Winter Wonderland

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Physical Science Standards** Properties of objects and materials	**Scientific Thinking and Problem-Solving** **Observing:** 2. Identify and/or describe objects by physical characteristics.	**2.G.02** Children are provided varied opportunities and materials to learn key content and principles of science such as: structure and property of matter (e.g., characteristics that include

Earth and Space Science Standards Properties of earth materials Changes in earth and sky	**Questioning:** 5. Make predictions about objects and natural events. **Investigating:** 6. Use tools (e.g., magnifying glass, binoculars, and maps) for investigation of the environment.	concepts such as hard and soft, floating and sinking) and behavior of materials (e.g., transformation of liquids and solids by dissolving or melting). **2.G.05** Children are provided varied opportunities and materials to collect data and to represent and document their findings (e.g., through drawing or graphing).

Objective: The students will be able to describe winter changes.
The students will be able to explain how ice is formed.
The students will be able to describe the temperature changes in the Winter.

Concepts: The students will learn about the different seasonal changes of winter.

Skills: Observing Measuring
Describing Counting

Key Words: Winter, Snow, Ice, Cold, Season

Learning Centers:

Learning Center:	**Preparation:**	**Activity:**
Sensory Table:	Snow/ice, bowls, scoops, and shovels	Discover snow/ice and observe how it melts throughout the day.
Science Center:	Snow, Ice, and Magnifying glass	Discover how snow and ice feels and looks.
Art (outside)	Snow, food coloring, spray bottle, and water	Color snow with colored water from a spray bottle.
Art (outside)	Snow, sleds	Create snowman, igloos, snow angels, and snow sculptures and play with sleds.

Math	Outdoor thermometers and graph	Discuss how the weather gets colder in the winter. Place the thermometers outside to record and observe the weather and temperature changes each day. Start a graph and count how many days it snows throughout the month.
Math	Measuring stick and graph	Place a measuring stick outside to measure how much snow is in the schoolyard. Keep track on a graph throughout the winter.
Dramatic play (Inside)	Laminated silver wrapping or aluminum paper and socks	Pretend ice skating rink on the laminated pond with socks

Large Group Activities:

Intro:
Ask the children what season it is? (Winter) Ask them what they know about winter and what are the seasonal changes in winter. Make a concept map with their responses. Make a ball of snow, let them feel it and describe it.

Day 1:

Materials:
Black construction paper or felt
Freezer
Magnify Glass

Put the black construction paper or felt into the freezer for a night. On a snowy day, bring the construction paper/felt outside with the kids. Have them hold the paper flat to catch snowflakes. Observe the snowflakes and notice how each one is different by using a magnify glass. Have them draw pictures of the snowflakes when they get inside.

Day 2:

Materials:
Icicle

Water
Ice Trays
Thermometers

Show each student an icicle. Ask them what it is. Have them feel and describe it. Ask them to guess how an icicles and ice are made. Explain how ice is created when the temperature gets colder out. Put water into an ice tray and place the ice cube trays outside on the playground. Observe how the ice freezes throughout the day or next couple of days. Place a thermometer outside and observe the temperature.

Conclusion:
Have them tell you their favorite thing to do outdoors in the winter. Then bring out the concept map and add more concepts of winter.

Other Classroom Ideas:
When it snows catch it on your tongue.
Make snow cones with a blender and ice.
Visit an ice skating rink.

Questions for Discussion:
How does the temperature change in the winter?
What happens in the winter?
What does snow and ice feel like?
How are snow and ice formed?

Taking it Further:
(Home Connections)
Build a snow fort, snowman or snow sculptures as a family.
Go sledding, skiing, ice-skating, or snow shoeing.
Measure the amount of snow in your yard.

Evaluation:
Use the concept map from the introduction and conclusion to evaluate the lesson.

Finger plays:

Snow is falling down
Snow is falling, falling down; Snow is falling to the ground.
(Move hands down, wiggling fingers like snowflakes)

Flurries, flurries
(slow beat, slowly said)
Snowing, snowing
(faster)
Blizzard
(Loud and very fast)

The Winter Song
(T*une: Farmer in the Dell)*
Let's sing a winter song,
Let's sing a winter song,
The days are short, the nights are long.
Let's sing a winter song.
The winter wind is cold,
The winter wind is cold,
It freezes noses, ears, and toes.

The winter wind is cold.
Winter now is here,
Winter now is here,
Put on your coat, your hat, your gloves,
Winter now is here

Dance Like Snowflakes
(Tune: Are you Sleeping)
Dance like snowflakes
Dance like snowflakes
In the air
In the air
Whirling, Twirling snowflakes
Whirling, Twirling snowflakes
Here and there
Here and there

Snowflake Song
(Tune: I'm a Little Teapot)
I'm a little snowflake, fat and round
Falling softly to the ground.
When enough of me falls hear me shout,
"Here's a snowball, better watch out!"
(Pretend to throw a snowball)

Lesson plan adapted from A to Z Teacher Stuff LLC. (2010). A to Z Teacher Stuff, retrieved from http://atozteacherstuff.com/Themes/

Lesson Plan adapted from The Perpetual Preschool. (1996). Ice Songs retrieved from http://www.perpetualpreschool.com/preschool_themes/ice/ice_songs.htm

Lesson Plan
Who Has Been in the Woods

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Science as Inquiry** Abilities necessary to do scientific inquiry **Life Science:** Organisms and environments **Science and Technology** Abilities to distinguish between natural objects and objects made by humans	**Scientific Thinking and Problem-Solving** **Observing:** 1. Use senses to explore materials and the environment. **Questioning:** 3. Express wonder about the natural world. **Investigating:** 7. Make comparisons between objects that have been collected or observed.	**2.G.02** Children are provided varied opportunities and materials to learn key content and principles of science: the difference between living and nonliving things and life cycles of various organisms. **2.G.03** Children are provided varied opportunities and materials to collect data and to represent and document their findings.

Objective: The students will be able to identify the difference between animal tracks and human tracks in the snow, mud, or sand.
The students will be able to identify different ways to identify animal presence.

Concepts: The students will realize that the tracks are a method to find animals and humans in nature.

Skills: Observing
Comparing
Matching
Describing

Key Words: Animal Tracks, Winter, Snow

Learning Centers:

Learning Center:	Preparation:	Activity:
T eacher-Directed	Plaster of Paris	Make their own footprints or handprints in Plaster of Paris.
Art	Paint, paper	Make hand and feet prints on paper.
Sensory Table:	Snow/mud/sand, ceramic animal paws, and plastic animals.	Have the students make prints in the snow/mud/sand.
Science Center:	Pans of snow/mud/sand and magnify glass.	Take a close look at tracks in each pan (day 1 activity).
Math	Photos of animals and photos of their tacks	Match animals with their tracks.
Math	Graph	Graph and count the number of tracks you see in the park and schoolyard.

Large Group Activities:

Intro:
Lead the students into a discussion of "tracks". Discuss that some times we leave tracks in the snow with our boots. What else leaves tracks in the snow? (Animal Tracks) Make a list of animal tracks they might see around our neighborhoods. Show pictures of animal tracks. Do a KWL chart with the students. Asking them what they know about animal tracks and what they want to learn. Save the part about what they learned until the end conclusion.

Day 1:

Materials:
Snow
Sand
Water
3 cake pans (big enough for child's foot)
Photos of animal tracks

Fill one cake pan with snow, one with dry sand, and one with wet sand. (Snow may melt so put extra snow in the cooler.) Have them put their feet or hands in each pan to make a track. Discuss how different types of weather help us to view animal tracks clearly.

"Which one is the easiest to see? Are tracks easier to see in dry or wet sand? How about snow?" *Leave the pans in science center for free choice time.

Day 2:

Materials:
Camera
Animal Tracks Field Guide

Take the class outside for a walk around playground or park. Look for animal or human tracks. When you come across human or animal tracks, discuss who made the tracks. Use a field guide to look up who made the track. Take a photo of the tracks they make in the snow. Discuss other signs of animals such as scat, fur, feathers, and nests. Look for those signs on the hike as well.

Conclusion:
Bring out the photos of animals and tracks. Have them match them as a large group. Then bring out the KWL chart and fill out what they learned part of the chart.

Other Classroom Ideas:
Pour Plaster of paris in a track to keep in the classroom.
Take a closer look at their own tracks in the snow.
Animal tracks rubber stamps.
Make individual track books with photos on animal tracks that kids bring from their neighborhoods at home.

Questions for Discussion:
What kind of animal tracks do you see in our neighborhood?
What is the difference between animal tracks and human tracks?
Can animals make tracks during other seasons besides winter?
What other ways can you tell an animal has been in the woods?

Taking it Further:
(Home Connection)
Go on a nature hike and look for signs of animals and tracks.
Take photos of tracks and create a book on animal tracks in your neighborhood.
Paint handprints and footprints at home.

Evaluation:
Use the KWL charts from the introduction and conclusion to evaluate the lesson.

Finger plays:

Snowflakes
(Tune: Gray Squirrel)
Snowflakes, snowflakes, falling on the ground
Snowflakes, snowflakes, falling all around.
I am bundled to my chin.
See my footprints where I have been.
Snowflakes, snowflakes, falling on the ground.

Boot Prints Poem
Up and down the yard, we go
Making boot prints in the snow
Big steps, little steps
Around and around
Oh what fun with snow on the ground! Black boots, white boots
Red boots bright
Isn't it strange our boot prints are white?

Walking In The Snow
Let's go walking in the snow,
(Walk)
Walking, walking on tiptoe.
(Tiptoe)
Lift your one foot
way up high
(Hop on one foot)
Then the other to keep it dry.
(Hop on other foot.)
All around the yard we skip.
(Skip)
Watch your step, or you might slip.
(Pretend to fall)

Lesson plan adapted from Gwen D. (2009). Animal tracks: Preschool and kindergarten science activities retrieved from http://www.parentingscience.com/kindergarten-science-activities-tracking-animals.html and Jana's Web Design (2008) Step by Step retrieved from http://stepbystepcc.com/snowman2.html

Lesson Plan
The Melt Down!

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Earth and Space Science Standards** Changes in earth and sky **Science as Inquiry** Abilities necessary to do scientific inquiry	**Scientific Thinking and Problem-Solving** Questioning: 5. Making predictions and objects and natural events. Investigating: 7. Make comparisons between objects that have been collected or observed.	**2.G.02** Children are provided varied opportunities and materials to learn key content and principles of science such as * structures and property of matter (e.g. characteristics that include concepts such as hard and soft, floating and sinking) and behavior of materials (e.g. transformation of liquids and solids by dissolving or melting).

Objectives: The students will be able to describe what happens to snow and ice in the Spring.
The students will be able to explain why snow and ice melt.

Concepts: The students will learn that seasonal changes of spring.

Skills: Observing
Predictions
Counting

Key Words: Snow, Ice, Melts, Sun, Warmer Weather

Learning Centers:

Learning Center:	Preparation:	Activity:
Teacher-Directed	Create ice cubes by freezing water	Float an ice cube in a glass of water. Have the children take a piece of string, lay it across the ice, and try to pick up the ice with the string. They will not be able to do this. Tell them to lay the piece of string on the ice again and have them sprinkle a pinch of salt over the string. Count to 10 and lift the string. Magic...it sticks!
Sensory Table:	Freeze rocks, sand, sticks and other natural materials into the water	What is hidden inside the ice? Children observe and discover the things that are frozen into ice as it melts. *Optional-Add rubber mallets and small safety glasses to help chip away the ice as it melts.
Science Center:	Pans of snow and ice	Which melts first snow or ice? Place pan of snow and ice for the kids to guess which melts first.
Science Center: Teacher-Directed	Create ice cubes by freezing Water.	What happens when you put salt on ice? Why do we put salt on icy roads? Have the kids observe and touch an ice cube before you add salt then after salt is added. *Add food coloring to help visually see the holes and tunnels the salt is creating on the ice.
Writing	Journals	Write/draw in journals what they observe in the different centers.

Art Table	Freeze water into ice cubes with various colors of food coloring.	Painting with Ice- As the ice melts, the water leaves a nice colorful mark on the paper.
Math	Create a chart in the classroom to keep track of how many days it takes for the snow to melt completely off the playground or park.	The Melt Down Count- Count the number of days it takes until all the snow is gone in their playground.

Large Group Activities:

Introduction: Ask the children what season is coming next. Then explain to them that spring is coming. Ask them what happens in the spring (warmer weather, melting snow, etc...). Show them a bowl of snow or ice, ask them what happens to snow, and ice in the spring? Create a concept map of their answers.

Day 1:

Materials:
Large poster paper/chalk board/white board to make predictions.
Plastic containers
Snow
Ice

Help young children experiment with ice cubes by placing the cubes (or snowballs if available) in various places around the classroom

Ask children to predict which ice cube will melt the fastest, considering where it is placed. Cubes can be placed in sunny windows, a dark closet, out side of a window, near a heater etc. Permit students to offer their suggestions.

Make a list or chart of the predictions then test their theories by encouraging preschoolers to check on the various areas every few minutes. When the results are in, record the findings on the list, or chart. Encourage children to express opinions about why a particular cube melted the fastest and why another melted the slowest.

Day 2

Same activities as Day 1 but extend it to the outdoors. Put the ice chunks into different areas of the playground. Ask children to predict which ice cube will melt the fastest, considering where it is placed. Cubes can be placed in a parking lot, under trees, in sunny areas, and in shaded areas. Make a chart or list on predictions on which ice will melt fastest on where it is placed. Then test their theories and record the results on the list or charts. Encourage the children to express their opinions about why a particular cube melted fastest and why another melted slowest.

Conclusion:
Bring out the concept map created in the introduction. Review what they already wrote and have them give you more ideas about spring and the melt down. *Use a different color to add to the concept map.

Other Classroom Ideas:
Create a snowman during the school year and watch it slowly melt away as the weather gets warmer.

Take a walk in the park and take notice what areas have snow and which ones are grassy. (Shaded or sunny areas) Ask them why they think snow is still there!

Questions for Discussion:
What happens to the snow and ice in the Spring?
Why does snow and ice melt?
What does snow and ice turn into after it melts?
Which melts faster snow or ice?

Taking it Further:
(Home Connection)
Make a snowman as a family observe while it slowly melts away each day.
Create a melt down count at home with their parents.

Evaluation:
Comparing the concept map from the introduction to what they added to it in the conclusion.

Finger plays:

Five little snowmen
There were five little snowmen,
Each with scarf and woolly hat,
Out came the sun and melted one;
It's sad- But that was that!

There were four little snowmen etc.

There are no little snowmen,
Just scarves and woolly hats,
Sitting in a puddle
In a very wet muddle;
It's sad -But that is that!

Once there was a snowman
Once there was a snowman,
snowman, snowman,
Once there was a snowman tall, tall,
tall. *(reach to the ceiling)*
Then the sun it melted, melted,
melted,
Then the sun it melted small, small,
small. *(pretend to melt)*

Melting Snowman
I am a snowman made of snow
(stand still)
I stand quite still at 10 below.
With a big long carrot for a nose, *(indicate body part)*
And worn out shoes to make my toes. I have two apples for my eyes,
And a woolen coat about this size.
(measure)
I have a scarf that's warm and red.
(circle arms around neck)
And a funny hat upon my head.
(touch hands to head)
The sun is coming out, Oh dear!
(make circle overhead w/arms)
The sun is melting me I fear
(begin to sink to floor)
Oh my, I was so nice and round,
Now I'm just a puddle on the ground! *(curl up on floor)*

Lesson plan adapted from Gwen D. (2009). Introducing the preschool science experiment: Ice and water retrieved from http://www.parentingscience.com/preschool-science-experiment.html and The Perpetual Preschool. (1996). Ice Songs retrieved from http://www.perpetualpreschool.com/preschool_themes/ice/ice_songs.htm

Lesson Plan
Fun in the Mud!

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Earth and Space Science Standards** Properties of earth materials Changes in earth and sky **Science as Inquiry** Abilities necessary to do scientific inquiry	**Scientific Thinking and Problem-Solving** **Observing:** 1. Use senses to explore materials and the environment. **Questioning** 3. Express wonder about the natural world. **Investigating:** 6. Use tools for investigation of the environment.	**2. G.03** Children are provided varied opportunities and materials that encourage them to use the five senses to observe, explore, and experiment with scientific phenomena. **2.G.04** Children are provided opportunities to use simple tools to observe objects and scientific phenomena.

Objective: The students will be able to describe mud.

The students will be able to explain how to make mud.

Concepts: The students will learn how mud is created from dirt and water.

Skills: Observing
Predicting
Describing
Using their senses

Key Words: Mud, Dirt, Water, and Rain

Learning Centers:

Learning Center:	Preparation:	Activity:
Teacher-Directed	Dirt and water in separate bowls Large bowl to combine the dirt and water.	Have the students create their own mud by adding water to dry sand or dirt. Have them describe how it feels and smell.
Block Area: (outside)	Mud Bricks (made on day one)	Use the mud bricks to create houses, buildings, bridges.
Sensory Table:	Make mud with dirt, sand, and water. Collect rocks, sticks, and other natural materials.	Mud Sculptures: Have the students create mud sculptures and just play in the mud.
Science Center:	Mud in a pan Magnifying glass	Have the students look through the magnifying glass at the mud.
Art Center	Mud, paper, and paint brushes ready	Painting with mud: Use brushes or fingers to create mud paintings.

Large Group Activities:

Intro:

Have the students sit in a large group circle and close their eyes. Have each student place his or her hand into a bucket of mud. Make sure to tell them not to say anything until every one had a turn placing their hands in the bucket. Have them describe what it feels like. (cold, slimy, lumpy, etc) Ask them to guess what is in the bucket. Then show them what it is. Create a concept map about what they know about mud. * Have a rag or paper towels ready for kids to wipe their hands off.

Day 1:

Materials:
Dirt
Water
Plastic bucket
Muffin tins or ice cube trays
Rag to clean hands

Have the students make mud bricks by having your child put the dirt in the plastic bucket. Then mix in just enough water to form a mud ball. Carefully press the mud into muffin tin cups or ice cube tray sections. Place the tins or trays in a sunny place to dry.

Day 2:

Materials:
Mud Bricks
Plaster of Paris or mud (for "cementing" the bricks together)
Sticks and weeds

When the bricks are hard and dry, have your child place them onto newspaper on the floor. Some of them will break and some will remain solid; use the solid ones for building. Now the building fun begins! Help your child attach bricks and other items together in a free-form building using plaster of Paris for the "cement". If you do not have Plaster of Paris, you can also use mud to bind the bricks together. Have your child carefully spoon plaster onto the other building materials (rocks, sticks, weeds, etc.) and attach them to the building. Let the building dry overnight. Depending on the size of the building, it may need longer to dry completely. Discuss how some cultures use mud bricks for homes.
Keep some mud bricks for block area to create more buildings

Day 3:

As a class, take a walk through the playground or park with the class looking for mud. Let them discover mud by touching, smelling, poking it with sticks, etc... Create your own mud with water and dirt.

Conclusion:
Bring out the concept map created in the introduction. Review what they already wrote and have them give you more ideas about mud. Also ask them to describe mud, how it feels, and smells. *Use a different color marker to add to the concept map

Other Classroom Ideas:
Outside: Draw pictures and write names in the mud. If there is no mud, create mud outside with water.

During a raining day, go outdoors and play in the mud. *Optional if you have proper clothing such as rain boots and raincoats for the students.

Questions for Discussion:
What do you need to make mud?
What happens to mud after it sits for a while?
What does mud feel like?
What does mud smell like?
What did you see in the mud when looking through the magnify glass?

Taking it Further:
(Home Connection)
Play with mud together at home on a rainy day or puddle jumping.
Observe the creation of mud on a rainy day in your yard.

Evaluation:

Comparing the concept map from the introduction to what they added to it in the conclusion.

Finger plays:

A Song for Making Mud Pie
(Tune: Sing a Song of Sixpence)
Sing a song for mud pie,
It's my favorite brand.
Mix it 'til it's mushy,
Squeeze it with your hand,
Put it in a tin pan,
Leave it in the sun.
Wait about an hour,
Then you know it will be done!

Mud, Mud, Mud Is Fun
(Tune: Row, Row, Row Your Boat)
Mud, mud, mud is fun,
Watch us stir it up,
Round, and round, and round, and round.
Mud is fun to make.

Mud, mud, mud is fun,
Listen to it squish,
Through our fingers, round our toes,
Squish is how it goes.

Lesson plan adapted from Education.com (2010) Make Mud Brick Buildings retrieved from http://www.education.com/activity/article/brick

Lesson plan adapted from Parenting Science. (2009). Preschool science experiment: Making mud bricks retrieved from http://www.parentingscience.com/preschool-science-experiment-mud.html

Lesson plan adapted from Preschool Planner 101 (n.d.) Preschool Lessons - Mud Bricks retrieved from http://preschoolplanner101.blogspot.com/2007/03/preschool-lessons-mud-bricks.html

Lesson plan adapted from Suite101.com (n.d.) Exploring Mud with Preschoolers retrieved from http://kids-outdoor-activities.suite101.com/article.cfm/exploring_mud_with_preschoolers

Lesson plan adapted from The Perpetual Preschool. (1996). Ice Songs retrieved from http://www.perpetualpreschool.com/preschool_themes/ice/ice_songs.htm
-making/;

Lesson Plan
Spring has Sprung!

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Life Science** Characteristics of organism Life cycle of organisms Organisms and environments **Earth and Space Science** Properties of earth materials	**Scientific Thinking and Problem-Solving** **Observing:** 1. Use senses to explore materials and the environment. **Questioning:** 3. Express wonder about the natural world. 4. Ask questions and seek answers through active exploration.	**2.G.02** Children are provided opportunities and materials to learn key content and principles of science such as the difference between living and nonliving and life cycles of various organisms. **2.G.03** Children are provided varied opportunities and materials that encourage them to use the five senses to observe, explore, and experiment with scientific phenomena.

Objective: The students will be able to explain what plants need to grow.
The students will be able to draw a picture of a plant.
The students will be able to describe how a plants grows.

Concept: The students will learn the different parts and the life cycle of plants.

Skills: Observing
Predicting
Sorting
Drawing

Key Words: Plants, Flowers, Trees, Weeds, Roots, Stem, Petals, Soil, Dirt, Water, Sun

Learning Centers:

Learning Center:	Preparation:	Activity:
Math Center	Different color, shape, and size seeds and different bowls to hold the seeds.	Sort seeds by size, colors, and shapes.

Math Center	Plant life cycle sequencing cards.	Students sequence the plant life cycle sequencing cards.
Sensory Table:	Soil/Dirt Garden tools Seeds	Gardening- Using garden tools have to students dig and bury seeds in the soil/dirt.
Science Center:	Potato, toothpicks and glass of water	Place for toothpicks in the potato, and then place the potato into the glass of water with the toothpicks at the rim holding it up. The potato will develop roots that suck up the water. This may take a while to develop the roots.
Science Center:	Cut the stem of a white carnation Put the white carnation in a glass of water with food coloring.	Observe the carnation suck the water up into the stem and color the flower. Discuss how: Roots get water and food from the ground. The stem carries water and food to leaves. Use a variety of different colors on flowers to create a rainbow of colored flowers.
Art Table	Paper, crayons, markers, paints, etc...	Draw a picture of the plant (beginning of unit). Draw a second picture again of the plant (towards the end of the unit).

Large Group Activities:

Introduction:
Show the kids a flower and ask them to describe it? Ask them what they think a flower or plant needs to grow. (sun, water, dirt, etc...) Write down the list on a piece of paper or white board. Ask them what plants start out as. (seed) Then show them the seed and ask them what they need to do in order for it to grow? (plant in dirt, water, sun)

Day 1:

Materials:
Toilet Paper/Paper Towel rolls (cut toilet paper in half and paper towel in thirds)
Potting Soil
Seeds
Watering can
Water
Tray
Plastic Wrap

Place the cut paper towel or toilet paper rolls into a box or tray. Have each student put in soil into one or two of the rolls. Then have them dig a small hole and put in the seed (Planting directions are on back of the seed packages). Lastly have them gently water each of their own plants with the watering can. Place each tray or box into a sunny spot in the classroom. Cover with plastic wrap until spouts appear. Each day have the kids observe, draw a picture, or journal the changes. Once the plants begin to grow, either have the kids bring them home to plant in yard or create your own flower garden in the schoolyard. In addition, the rolls are biodegradable so you can plant them into the ground with the plant.

Conclusion:
Create a concept map of what they know about plants and flowers. Have them tell you all they know about the plants.

Other Classroom Ideas:
Plant a vegetable or flower garden and have the kids help with the care throughout the summer.
Plant a class tree in the schoolyard or park, give it a name, and observe as it grows each year.
Place grass seed on a wet sponge and watch it grow. (keep the sponge wet everyday)
Have the child plant a flower for mother's day.

Questions for Discussion:
What do plants need to grow?
What happens to the seeds after you plant them?
What are the parts of the plants?

Taking it Further:
(Home Connection)
Plant a garden together and enjoy taking care of it together.
Plant a tree in your yard and observe as it grows each year.

Evaluation:
Compare the plant drawings they made at the beginning of the unit to the ones they created at the end of the unit.

Finger plays:

Flower Garden
(Tune: "The Farmer in the Dell")
The farmer plants the seeds
The Farmer plants the seeds
Hi, Ho and Cheery O
The farmer plants the seeds.

(Use the following verses.)
The sun begins to shine
The rain begins to fall
The plants begin to grow
The flowers smile_at us

Parts of the plants
(Tune: "Head, Shoulders, Knees and Toes")
Do you know the parts of plants,
parts of plants?
Do you know the parts of plants,
parts of plants?
All kinds of plants that grow and
grow and grow.
Do you know the parts of plants,
parts of plants?

The roots hold the plant in place,
plant in place.
The roots hold the plant in place,
plant in place.
The roots store food and water too.
The roots hold the plant in place, plant in place.

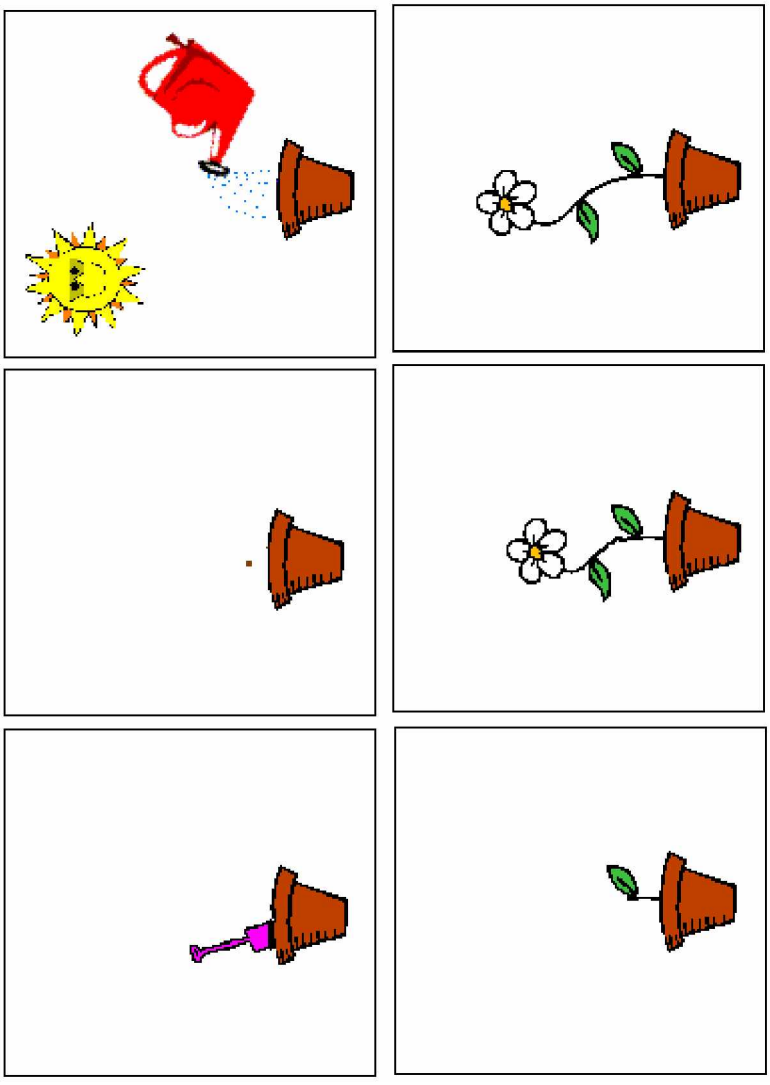
The stem moves water up the plant, up the plant.
The stem moves water up the plant, up the plant.
The stem brings water to the leaves.
The stem moves water up the plant, up the plant.

The leaves soak up the sun, soak up the sun.
The leaves soak up the sun, soak up the sun.
The sun helps the plant to grow and grow and grow.
The leaves soak up the sun, soak up the sun.
The flower grows into a fruit, into a fruit.
The flower grows into a fruit, into a fruit.
Inside the fruit are little, tiny seeds.
The flower grows into a fruit, into a fruit.

A Little Sun
A little sun *(hold arms above head)*
A little rain *(wiggle fingers)*
Now pull up all the weeds
(pretend to pull weeds)
Our flowers grow, all in a row
(hold up all ten fingers lined up like flowers)
From tiny little seeds.
(hold thumb and finger to show seeds)

Lesson plan adapted from A to Z Teacher Stuff LLC. (2010). A to Z Teacher Stuff, retrieved from ttp://atozteacherstuff.com/Themes/

Lesson plan adapted from Preschool Education (2010) Preschool Education retrieved from http://www.preschooleducation.com/

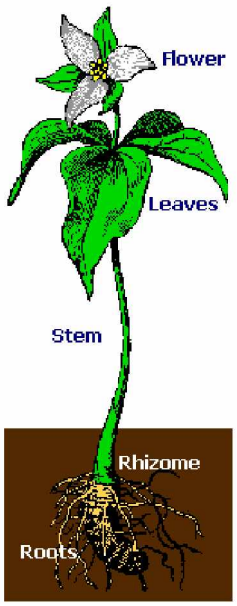


- **Flowers: make seeds or fruit**

- **Leaves: make food for plant**

- **Stems: carry water and food to leaves**

- **Roots: get water and food from ground**



- **Seeds: make new plants**

Lesson Plan
Feathered Friends!

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Life Science** Characteristics of organisms Organisms and environments **Earth and Space Science** Properties of earth materials	**Scientific Thinking and Problem-Solving** **Questioning** 3. Express wonder about the natural world. **Investigating:** 6. Use tools (e.g., magnifying glass, binoculars, maps) for investigation of the environment.	**2.G.02** Children are provided varied opportunities and materials to learn key content and principles of science such as the difference between living and nonliving things and life cycle of various organisms. **2.G.04** Children are provided varied opportunities to use simple tools to observe objects and scientific phenomena.

Objective: The students will be able to describe the bird's wings, beak, and talons.
The students will be able to explain what birds eat.
The students will be able to explain where birds live

Concepts: The students will learn about different bird characteristics.

Skills: Observing
Describing
Sorting

Key Words: Birds, Feathers, Beaks, Seeds, Berries, Worms, Nest

Learning Centers:

Learning Center:	Preparation:	Activity:
Listening Station	Bird Sounds CD (or I-bird) and head phones.	Listen to different bird sounds.
Sensory Table:	Bird Seeds Different tools (tweezers, pinchers, pliers, etc..) to represent beaks.	Different tools (tweezers, pinchers, pliers, etc..) that represent beaks to pick up bird seeds and place them in cups.
Science Center:	Feathers (different kinds, sizes, colors).	Have different kinds of feathers and bird's nest for them to discover. Add magnify glasses to look more closely.
Science Center:	Feathers, eyedropper, and water	Have a couple of feathers in the science center, use an eyedropper, and drop a couple of drops of water on the feather. Observe how the water repels off the feather.
Art Center	Toilet paper or paper towel rolls (cut the paper towel rolls in half), string	Binoculars Staple two rolls together and add string. Use the toilet paper rolls binoculars to watch birds. Have real binoculars for them to use as well.
Writing	Journals	Journal as they observe birds in the yard and at the park.
Art Center	Feathers, paint, and paper	Feather Painting
Math Center	Graph	Graph and count the birds they see each day in the schoolyard and/or park for the whole month.

Large Group Activities:

Intro:
Explain that they will be learning about birds this month. Create a concept map on what they know about birds already.

Have a picture of a bird or stuffed bird, ask the kids what it is, and describe it. Talk about the different parts of the bird such as beak, wings, tail, feet, etc... In addition, what they use these parts for such, as wings and tails are used to help the birds fly.

Day 1:

Materials:
Pinecones
Peanut butter *Peanut allergy-use shortening or lard
Seeds
String (Tie string unto pinecones)
Butter knife

Ask the students what birds eat? (Seeds, berries, bugs, and worms) Tell them they will be making bird feeders. Have the students rub peanut butter unto the pinecones with the butter knife then roll pinecone into birdseeds. Bring the bird feeders outside to hang in the park or schoolyard. Observe them throughout the week; even though they may not see the birds, they can see if birds have left marks on the feeders.

Day 2:

Materials:
Natural Materials (sticks, leaves, grasses, etc...)
Glue Paper
Construction paper

Ask the students where birds live. Tell them that they will be making their own nests like birds. Have the students pretend to be birds and gather natural materials (Sticks, feathers, fur, grasses) to make their own bird's nest outside in the park or on the playground.
Create their own bird's nest with the material they have collected. Glue the natural materials unto a piece of construction paper. Discuss that birds use their nests to lay eggs and keep them warm. Baby birds live in the nest until they are old enough to fly away.

Conclusion:
Bring out the concept map used in the introduction and add new concepts the kids learned throughout this lesson in a different color marker.

Other Classroom Ideas:
Hatch an egg in an incubator.
Have a pet bird visit the class or a raptor from the local nature center or zoo.
Go bird watching in the park.

Questions for Discussion:
Can you describe a bird?
What do birds eat?
What do birds use to make nests?
Where do birds fly in the winter?

Taking it Further:
(Home Connection)
Go bird watching at a park.
Collect feathers * *Some feather are illegal to have such as American bald eagle.*
Visit a pet store or nature center that has birds.

Evaluation:
Compare the concept map in the introduction to what they added in conclusion to evaluate their knowledge and understanding.

Finger plays:

Feathered Birds
Five feathered birds sitting on the door;
One flew away and then there were four.
Four feathered birds singing in the tree,
One flew away and then there were three.
Three feathered birds looking at you,
One flew away and then there were two.
Two feathered birds sitting in the sun,
One flew away and then there was one.
One feathered bird looking like a hero,
He flew away, and now there are zero!

If I Were a Bird
If I were a bird, I'd sing a song
And fly about the whole day long
(twine thumbs together and move hands like wings)
And when the night comes, go to rest,
(tilt head and close eyes)
Up in my cozy little nest.
(cup hands together to form nest)

The Woodpecker

The woodpecker pecked out a little round hole
(Tap left hand with right pointer)
And made him a house in the telephone pole.
One day as I watched he poked out this head
(Poke out head)
He had on a hood and a collar of red.
(Point to head and neck)
When the streams of rain pour out of the sky,
(Bring fingers down like rain)
And the flashes of lightening go streaking by
(Streak arms like lightening)
And the big, big wheels of thunder roll
(Roll arms)
He can snuggle back in his telephone pole.
(Hug yourself)

Lesson plan adapted from Iowa Conservation Board. (2004). Group Activities retrieved from http://kindernature.storycounty.com/aboutus.aspx

Lesson plan adapted from Jana's Web Design (2008) Step by Step retrieved from http://stepbystepcc.com/birds.html

Lesson Plan
Over the River

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Physical Science** Properties of objects and materials **Life Science** Organisms and environments **Earth and Space Science** Proprieties of earth materials	**Scientific Thinking and Problem-Solving** **Questioning:** 3. Express wonder about the natural world. 4. Ask questions and seek answers through active exploration. **Investigating** 7. Make comparisons between objects that have been collected or observed.	**2.G.03** Children are provided varied opportunities and materials that encourage them to use five senses to observe, explore, and experiment with scientific phenomena. **2.G.06** Children are provided opportunities and materials that encourage them to think, question, and reasons about observed and inferred phenomena.

Objective:

The students will be able to describe three characteristics of the river.
The students will be able to explain ways people and animals use rivers.

Concepts:

The students will learn characteristics and uses of rivers.

Skills: Observing
Predicting
Describing
Sorting

Key Words: Water, Cold, Rocks, River, Stream, Rafts, Bridges

Learning Centers:

Learning Center:	Preparation:	Activity:
Teacher-Directed	Natural materials(sticks, leaves, pinecones, etc..) wood glue, string	Create a vessel or raft to float down the river for day two activity.
Writing	Journal	Visit the river frequently and write or draw pictures of what the see in the river in the park.
Sensory Table:	Water, rocks, sand, sticks, and other natural materials	Create a river in your sensory table with sand, rocks, and waters. Have the kids develop their own rivers in the sensory table.
Science Center:	Fill a Plastic bottle with items from the river (sand/dirt, rocks, leaves, water, etc...)	Create your own river in the water bottle. Have the kids shake it and watch it settle into the layers of the river.
Math	River Rocks: students can help find rocks out of the river.	Sort rocks from the river by size, color, shape.

Large Group Activities:

Intro:
In the classroom, start a KWL Chart with the students. What they know about rivers, what they want to learn on a piece of large paper. (Save the "what they learned" part of the chart for the conclusion.)

Then take the group of students to the river. Ask them to describe a river. What types of wildlife use rivers? What does it feel like? What does it sound like? Are their any signs of animals? What could animals use the river for? Why do humans use rivers? Have them spend the rest of the time exploring the river, touching, listening to it, and observing.

Day 1:

Materials:
plastic drop cloth or tarp
buckets of sand and mud
bucket of fist-sized rocks
pitcher of water

Place drop cloth or tarp on the ground. Just like most rivers, this river is going to start at a high place. Create a mountain by piling rocks into a pile unto the tarp. Fill in the mountain by packing the sides of rocks with sand and mud. Add more mud to the tarp around the base of your mountain. Gently pour the pitcher of water over the mountain. Watch as the water creates a path or more then one path down the mountain. Ask the students: Does it form a deep channel at the top of your mountain? Does the channel widen as it flows down the mountain?

Day 2:

Materials:
The vessels or rafts made in class
Stop Watch
Clip Board
Paper
Pencil

Walk to the river near the school. Have the students predict what will happen when they put their raft into the river. Have them split into two groups. Have one group go further up the river and release their rafts, while the other group stands below and times them as they float by. Then have each group trade spots. Discuss that rivers are sometimes used for transportation.

Conclusion:
Bring out the KWL Chart they started in the introduction. Have the students finish the column on what they have learned about rivers.

Other Classroom Ideas:
Look for animal tracks and other signs of animals (feathers, scat, etc...) around the river.
Clean-up the trash around the river.
Listening station: River sounds (CD and Headphones).

Questions for Discussion:
What is a river?
What does it feel like?
What does it sound like?
Why do people use rivers?
Which wildlife use rivers?

Taking it Further:
(Home Connection)
Take a walk to one of the rivers and parks in town.
Create your own river in your back yard.

Evaluation:
Use the KWL charts as a way to evaluate the knowledge the students have obtained during this lesson.

Finger plays:

Down The River
(Tune: "Clementine")
Down the river, swiftly flowing
Comes a lovely golden boat
Light it drifts, as any feather
On the rushing sea afloat.

Not a mast or sail to guide it
On the yellow deck is seen,
But a host of tiny fairies
Taking home their Fairy Queen.

Now I tell you that my river
Was a gutter stream that flowed,
And my boat, a leaf of Maple
That the frost had turned to Gold

Listen to the water
Listen to the water; listen to the water, rolling down the river, Listen to the water; listen to the water, rolling down the river.

We saw some birds by the waterside
We saw some birds by the waterside
We saw some birds by the waterside
Oh, oh, by the waterside.
Oh, oh, by the waterside.

We saw some fish by the waterside,
We saw some fish by the waterside,
We saw some fish by the waterside,
Oh, oh, by the waterside.
Oh, oh, by the waterside.

We saw some ducks by the waterside,
We saw some ducks by the waterside,
We saw some ducks by the waterside,
Oh, oh, by the waterside.
Oh, oh, by the waterside.

We saw some flowers by the waterside,
We saw some flowers by the waterside,
We saw some flowers by the waterside,
Oh, oh, by the waterside.
Oh, oh, by the waterside.

Lesson plan adapted from Castaldo, N. F. (2006) *River Wild: An Activity Guide to North American Rivers.* Chicago, IL: Chicago Review Press, Incorporated.

Lesson plan adapted from Jana's Web Design (2008) Step by Step *Retrieved from* http://stevbvstevcc.com/boat.html

Lesson Plan
Nature Sense

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Physical Science** **Properties of objects and materials** **Life Science** **Characteristics of Organisms** **Earth and Space Science** **Properties of earth materials**	**Scientific Thinking and Problem-Solving** **Observing:** **1. Using senses to explore materials and the environment.** **2. Identify and/or describe objects by physical characteristics.** **Questioning:** **3. Express wonder about the natural world.** **Investigating:** **7. Make comparisons between objects that have been collected or observed.**	**2.G.04** **Children are provided varied opportunities and materials that encourage them to sue the five senses to observe explore, and experiment with scientific phenomena.** **2.G.06** **Children are provided varied opportunities and materials that encourage them to think, question, and reason about observed and inferred phenomena.**

Objective: The students will be able to describe how nature sounds.
The students will be able to describe how nature feels.

Concepts: The students will be learning how to use their five senses in nature.

Skills: **Describing**
Sorting
Writing

Key Words: Feel, Smell, Taste, See, Hear, Senses

Learning Centers:

Learning Center:	Preparation:	Activity:
Teacher-Directed	Film Containers natural materials that smell: moss; wild onions, berries, fresh pine needles, etc...	Put materials into containers and have students guess what is inside them by smell!
Writing	Journal	Journal or draw pictures on what they hear, feel, see, and smell in nature.
Sensory Table:	Natural earth clay, dirt	Let the kids explore natural clay, shaping and forming things in the clay.
Science Center:	Magnify glass & textured objects: rock, bark, feathers, furs, moss, pine needles, grass, flowers, and pinecones.	Explore different natural objects. Have them use a magnify glass to get a closer look.
Math	Natural objects texture or shape, rock, bark, feathers, furs, moss, pine needles, grass, flowers, and pinecones	Sort the objects by shape, size, and texture.
Listening	CD's with nature sounds: water, birds, rain, storms, etc.	Have the students listen to CD's of nature sounds.

Large Group Activities:

Intro:
Have the students explain to you their five senses. You may have to explain them if they do not know. Then make a concept map of things they can hear, see, feel, taste, and smell in nature.

Day 1:

Materials:
Bag or pail
Blindfolds
Natural Materials: Pinecones, rocks, moss, grass, pine needles, branches, feathers, berries
Cups
Things you can taste that comes from natures (berries, mint leaves, fruits, etc...).

(Optional: Blindfold the students or have them close their eyes.) Put an item in the bag, have each child put their hand in the bag and describes what they feel. Have them use words such as hard, soft, rough, smooth, small, big, etc... to describe the item in the bag. Then have them guess the item. You may have to remind them to not say anything until everyone has had a turn to feel the item. Take out the item after they guess to see if they are correct. Then put in another item. After they play the guessing game, have them taste some items found in nature. Very important to remind them they cannot eat things in nature without parent's permission.

Day 2:

Materials:
Journals

Take the students into the schoolyard or park. Have them sit in a circle with their eyes closed! Have them tell you what they hear. Then have them open their eyes and tell you what they can see? What can they feel? Let them explore the area for a while. Give them their nature journal and have the draw what they see, feel, smell, etc.

Conclusion:
Review with them what can they smell, taste, touch, hear, and see when they are outside. Bring out the concept map and add more to it.

Other Classroom Ideas:
Create their own nature texture book with construction paper and natural materials
Create a natural snack such as trail mix, ants on log, etc.
Have them guess what is in the bucket each day.

Questions for Discussion:
What are some sounds you hear when outside?
What are some things you can smell when outside?
What are some of things that taste good that you get from nature?
What do you see when you go outside?
What can you feel when you explore nature?
What do you enjoy about being outside?

Taking it Further:
(Home Connections)
Go on a nature walk with their families.
Go to a farmer's market

Evaluation:

Use the concept map to compare their knowledge for the beginning of the lesson to the concepts they added at the end.

Finger plays:

Rocks are Hard.
(Tune: Three Blind Mice)
Rocks are hard
Rocks are hard
Oh so hard
Very hard
Some are very big rocks
And some are very little rocks
But all rocks are hard
All rocks are hard

Five Senses
(Tune: Where is Thumbkin)
Five senses, five senses
We have them. We have them.
Seeing, hearing, touching,
Tasting and smelling.
There are five. There are five.

I See the Green Grass
I see the green grass
(Look down and point to the ground)
Under my feet
(Lift up one foot at a time)
It tickles my toes
(Wiggle toes)
And it smells so sweet
(Sniff and smile)
It feels so soft
(Stroke arm with finger tips)
Like a bed, you know
(Hands under face as if sleeping)
I see the green grass
(Look down and point to the ground)
Grow, grass grow!
(Raise hands while wiggling fingers)

Lesson plan adapted from FreeKidCrafts.com. (2010). Fall 5 Senses Nature Walk retrieved from http://www.freekidcrafts.com/fall-5-senses-nature-walk.html

Lesson plan adapted from Iowa Conservation Board. (2004). Group Activities retrieved from http://kindernature.storycounty.com/aboutus.aspx

Lesson Plan
The Great Lake

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Life Science** Organisms and environments Characteristics of organisms **Earth and Space Science** Properties of earth materials	**Scientific Thinking and Problem-Solving** **Observing:** 1. Use senses to explore materials and the environment. 2. Identify and/or describe objects by physical characteristics. **Questioning:** 3. Express wonder about the natural world. **Investigating:** 6. Use tools for investigation of the environment.	**2.G.02** Children are provided varied opportunities and materials to learn key content and principles of science such as: the difference between living and non-living things and life cycles of various organisms. **2.G.03** Children are provided varied opportunities and materials that encourage them to use the five senses to observe, explore, and experiment with scientific phenomena.

Objective: The students will be able to describe Lake Superior.
The students will be able to identify some animals in and around Lake Superior .

Concepts: The students will learn different characteristics in and around Lake Superior.

Skills: Describing
Sorting
Listening

Key Words: Lake Superior, Water, Lake, Fish, Seagulls, Waves, Bridges, Boats, Ships

Learning Centers:

Learning Center:	Preparation:	Activity:
Block Center	Light houses, boats, ships, and photos of bridges	Have the kids build bridges like the Duluth Lift Bridge and add lighthouses, ships, and boats.
Sensory Table:	Minnows and water	Have the kids feel and play with minnows. Make sure they wash their hands afterwards.
Sensory Table:	Water, boats, ships, lighthouses, plastic toy fish, and bridges	Have the students pretend the table is Lake Superior with water, boats, ships, plastic fish, lighthouses, and bridges.
Listening	Waves CD, CD player, and headphones	Listen to sounds of Lake Superior waves.
Science Center:	Water, rocks, shells, and other natural materials from Lake Superior and magnify glass	Have the kids take a closer look and discover Lake Superior. Let them touch the water to feel how cold it is.
Math	Various rocks from Lake Superior	Sort rocks from Lake Superior by size, colors, and shapes.
Dramatic Play Center	Blue cloth	Have them create waves and pretend to swim in Lake Superior.
Dramatic Play Center	Fish, turtle, seagull and other animal puppets	Pretend play with the animals on Lake Superior.

Large Group Activities:

Intro:
Show them a map of Lake Superior and ask them to describe? What do you think of when you think of Lake Superior? Make a concept map of the things they know about Lake Superior. Discuss how very fortunate it is that they live near the largest and deepest fresh water lake in the world.

Day 1:

Materials:
Photos of animals in and around Lake Superior
Photos of bridges and ships
Photos of waves
Rocks from Lake Superior
Lake Superior Agate
Shells from Lake Superior

Tell the students that they are going to pretend that they are sitting near Lake Superior. What do they see on Lake Superior? (Friends & family swimming & playing, rocks, sand, birds) What do they smell? (The water, fish) What do they hear? (Waves, seagulls, boat horns) Show the students the pictures of waves, animals, boats, ships, and bridges on Lake Superior. Pass around the rocks and shells. Show them a Lake Superior Agate; which is the Minnesota State Rock.

Day 2:

Materials:
Waves CD/CD player
Blue cloth
Photos of waves on Lake Superior

What do you think of when you think of Lake Superior? Have the students sit and listen while you play the recording of waves (you can have them close their eyes if they want to). As you play the CD, discuss what they hear. Show them photos of waves. Have them act out big waves and small waves with a blue cloth. Ask the students what they think causes most waves. (Wind is the most common cause of waves on the water). Explain to them that when there is very little wind, the waves are small and when there are big gusts of wind, the waves are large.

Conclusion:
Ask them to review what they know about Lake Superior and add new concepts to the concept map in a different color.

Other Classroom Ideas:
Take a trip to Lake Superior.
Visit the Great Lakes Aquarium.
Visit Canal Park to watch the Lift Bridge and ships.

Questions for Discussion:
What animals live in or near Lake Superior?
What creates waves?
What do you hear near Lake Superior?
What do you see near Lake Superior?
What is special about Lake Superior?

Taking it Further:
(home connection)
Trips to Lake Superior to observe wildlife and boats.
Visit Canal Park or the Great Lakes Aquarium.

Evaluation:
Compare the concept map from the introduction and conclusion to evaluate the lesson.

Finger plays:

I'm a Little Fishy
(Tune: I'm a Little Teapot")
I'm a little fishy, I can swim.
Here is my tail, here is my fin.
When I want to have fun with my friends.
I wiggle my tail and dive right in.

Down by the Shore
(Tune of: Down By the Bay)
Down by the shore
In the sand and the sun,
I like to dive
And splash and run.
And as the waves
Roll out and in,
I'll get warm in the sun
And have lots of fun,
Down by the shore!

I Went to Lake Superior
I went to Lake Superior
And what did I see?
(Make binoculars with hands.)
A bird on the sand
Looking at me!
(Make beak with fingers over nose.)
I went to Lake Superior
And what did I see? *(Binoculars)*
A fish in the water
Splashing at me!
(Wiggle one hand to imitate fish swimming.)
I went to Lake Superior
And what did I see? *(Binoculars)*
A boat in the water
Passing by me!
(Raise hand and move up and down like a boat on water)
I went to Lake Superior
And what did I see? *(Binoculars)*
A Wave on Lake
Trying to get me
(jump back like your jumping away from the wave)

Sea Gulls
I like to watch the sea gulls
(Fist up to eyes)
Playing in the Sky,
Dipping and soaring
(Wave arm in air)
Through the clouds,
I wish I could fly.

Lesson plan adapted from Jana's Web Design (2008) Step by Step retrieved from http://stepbystepcc.com/beach.html

Lesson Plan adapted from Lake Effects: The Lake Superior Curriculum Guide Great Lakes Connection Curriculum Guide Paddle to the Sea Curriculum Guide

Background Information:

The Great Lakes make up the largest freshwater system in the world. The five Great Lakes cover a total area of 94,000 square miles (244,000 square kilometers), and contain approximately 18% of the world's fresh surface water. Lake Superior is the largest, deepest, and coldest of the Great Lakes. Measured across its greatest dimensions, it is 350 miles (563 kilometers) long and 160 miles (260 kilometers) wide. It has a surface area of 31,700 square miles (82,100 square kilometers) making it the largest freshwater lake in the world, based on surface area. The deepest point of the lake, located about 40 miles (65 kilometers) north of Munising, Michigan, is 1335 feet (405 meters) deep. The lake holds approximately three quadrillion gallons (11.4 quadrillion liters) of water - more than half the water in all the Great Lakes combined. The average annual surface water temperature for Lake Superior is approximately 40°F (4.4°C).

Superior Outdoor Inc. (2009). Eco Tour: About Lake Superior retrieved from http://www.superiorecotour.com/index.php/about-lake-superior.html

Lesson Plan
Fall into Autumn

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Physical Science** Properties of Objects and materials **Earth and Space Science** Properties of earth materials Changes in earth and sky	**Scientific Thinking and Problem-solving** **Observing:** 2. Identify and/or describe objects by physical characteristics. **Questioning:** 3. Express wonder about the natural world. 4. Ask questions and seek answers through active exploration.	**2.G.02** Children are provided varied opportunities and materials to learn key content and principles of science such as: earth and sky. **2.G.04** Children are provided varied opportunities to use simple tools to observe objects and scientific phenomena.

Objective: The students will be able to identify three colors that leaves change.
The students will explain why leaves change colors.

Concepts: The students will be learning about the seasonal changes in the Autumn.

Skills: Observing
Sorting
Describing
Counting

Key Words: Fall, Autumn, Trees, Leaves, Acorns, Pinecones, Pine Needles, Chlorophyll, Nuts, Season

Learning Centers:

Learning Center:	Preparation:	Activity:
Teacher-Directed	Leaves, pinecones, pine needles, acorns, other nuts, construction paper, and glue.	Create a nature collage by gluing natural materials onto the paper. Let the kids be creative.

Writing	Journal	Have the kids journal or draw what they see outside in the autumn (journaling can be done inside or outside).
Sensory Table:	Leaves, acorns, pine needles, pinecones	Investigate leaves, pinecones, pine needles, and acorns. Let the children crunch leaves and take a part acorns and pinecones.
Science Center:	Leaves, acorns, pine needles, pinecones and magnify glass	Have the kids take a closer look at nature in Autumn. Break open an acorn to see what is inside of it.
Math	Create a graph for tree colors.	As the leaves turn colors, graph the trees by colors and keep a count of how many orange, red, yellow, green trees you have in the neighborhood.
Math	Leaves of different color, size and shape. Acorns with caps and no caps Nutcracker to crack open acorns.	Sort leaves into categories of different size, shape colors. Sort acorns into categories of no caps, caps, cracked acorn, just capes.
Art Table	Leaves, paper, crayons	Leaf Rubbings- Place a leaf underneath a piece of paper and rub the top of the paper with the side of the crayon.
Dramatic Play (on Playground)	Mini Rakes	Let the kids rake the school yard with kid sized rakes.

Large Group Activities:

Intro:

Ask the students what season is it. (Autumn or fall) Create a KWL Chart of what they know about autumn, what they want to learn about autumn. (Save the learn part of the KWL chart for the conclusion)

Explain to the students that this is the season when trees change color. Discuss this change. What part of the tree changes color? (The leaves) What color does a leaf have

most of the time? (Green) When they change color, do all leaves change into the same color? (No) Have the students list fall colors of leaves from local trees.

Tell the students that leaves have something in them that makes them green (chlorophyll). When the days get shorter and colder, the tree stops making it and the other colors can be seen. The chlorophyll breaks down and the green color begins to disappear being replaced with red, yellow, orange, and brown colors. Show the students a green leaf and a colored leaf to see the differences. Also, explain that leaves come in different shapes and sizes depending on the type of tree. Some have big leaves such as a maple leaf and some are smaller like an aspen leaf. Some are smoother and some are rougher.
Also, discuss how pine trees only lose some pine needs and stay green all winter.

Day 1:

Materials:
Plastic bags

Take a nature walk around the school neighborhood or park. Have the students gather autumn materials such as pinecones, pine needles, leaves, acorns, and other nuts. (These will be used in your centers and other projects) Discuss things that fall to the ground during fall such as leaves, seeds, nuts, pine needles.

Day 2:

Materials:
Leaves
Acorns
Pinecones
Pine needles
Ribbon for a bow
Brown tempera paint
Paper plates
Glue

Fall Wreath: Cut the center out of a paper plate and have the children paint the paper plate brown. When the plates are dry give the children glue and let them have fun adding their natural materials to create a great fall wreath.

Conclusion:
Bring out their KWL Chart on autumn and fill in the column on what they learned. Have them explain all they learned about autumn.

Other Classroom Ideas:
Rake leaves into a pile in the schoolyard and let them jump in them.
Create a leaf book of all different kinds and colors of leaves found in the schoolyard or park.
Visit an apple orchard.

Questions for Discussion:
What colors are leaves in the summer?
What colors do they turn in the autumn?
Why do leaves turn colors?
What are some things that fall off trees and plants in the autumn?

Taking it Further:
(Home Connection)
Rake leaves and jump into the pile.
Go for a fall drive or nature hike.
Do leaf rubbings and nature collages at home.

Evaluation:
Use the KWL Chart in the introduction and conclusion to evaluate the lesson.

Finger plays:

Leaves on the Tree
(tune: "Wheels of the Bus")
The leaves on the trees turn orange
and brown . . . orange and brown. ..
.orange and brown
The leaves on the trees turn orange
and brown, all over town.
The leaves on the trees come
tumbling down, tumbling down,
tumbling down
The leaves on the trees coming
tumbling down, all over town.
The leaves on the ground go
Swish, swish, swish...
Swish, swish, swish...
Swish, swish, swish
The leaves on the ground go
Swish, swish, swish,
All over town.

The Leaves are Falling Down
(Tune: "The Farmer in the Dell")
The leaves are falling down
The leaves are falling down
Red, yellow, green and brown
The leaves are falling down

Fall Poem
Red and yellow, green and brown.
(Count off colors on fingers)
Leaves are falling to the ground.
(Simulate falling leaves with hands)
We pile them up OH SO HIGH:
('pile' leaves with hands)
Then we JUMP in!

Gray Squirrel
Gray Squirrel, Gray Squirrel
Shake your bushy tail
(pretend to shake tail)
Gray Squirrel, Gray Squirrel
Shake your bushy tail
(pretend to shake tail)
Wrinkle up your funny nose
(act out line)
Put a nut between your toes
(pretend to eat a nut)
Gray Squirrel Shake your bushy tail
(Pretend to shake a tail)

Lesson plans adapted from Jacobs, G. (2009). Gayle's Preschool Rainbow retrieved from http://www.preschoolrainbow.org/

Lesson plan adapted from Preschool Education (2010) Preschool Education retrieved from http://www.preschooleducation.com/

Lesson plans adapted from School Rock, Inc. (2008). Preschool Rock. Com retrieved from http://education.preschoolrock.com/index.php/curriculum_themes/preschool-theme—autumn

Lesson Plan
Whose Home is this

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Physical Science** Properties of objects and materials **Life Science** Characteristics of organisms Organisms and environments	**Scientific Thinking and Problem-Solving** **Observing:** 1. Use senses to explore materials and the environment. **Questioning:** 3. Express wonder about the natural world. 4. Ask question and seek answers through active exploration.	**2.G.06** Children are provided varied opportunities and materials that encourage them to think, question, and reason about observed and inferred phenomena. **2.G.07** Children are provided varied opportunities and materials that encourage them to discuss scientific concepts in everyday conversation.

Objective: The students will be able to explain where animals live.
The students will be able to identify animal habitats.

Concepts: The students will be learning that animals have different homes or habitats.

Skills: Observing
Sorting
Describing

Key Words: Habitat, Forests, Prairies, Woodland Animals, Ponds, Aquatic Animals

Learning Centers:

Learning Center:	Preparation:	Activity:
Block Center	Plastic Woodland Animals	Add plastic woodland animals to the block center to create animal homes.
Sensory Table:	Sticks, water, and sand	Create your own beaver dam.

Science Center:	Birds nests, bee hive, snail shells, clam shells, and grass, sand, and magnify glasses.	Take a closer look at some of the animal's homes.
Math	Habitat sort photos (photos of animals and their homes).	Sort animals by where they live: forests and ponds.
Dramatic Play	Black cloth, plastic toy bats, and spiders	Create a bat cave for the kids to pretend to be bats.

Large Group Activities:

Intro:

Show pictures of animals such as birds, squirrels, bears, bats, bees, fish, etc. Ask the students where each animal lives or what type of habitats they live in? Make a KWL chart of what they know about animal habitats and what they want to learn.

Day 1:

Take a nature walk in the park looking for animal homes. Discuss where each animal can live. Draw photos of the habitats they observe in the park.

Day 2:

Materials:
Natural Materials (leaves, pinecones, pine needles, etc...)
Glue
Paper
Paper cup cut in half (cave)

Discuss what animals use to make their homes. Name off some animal homes (nests, hives, beaver dams, anthill, etc.) Have the kids pretend to be animals and gather natural materials for their own animal homes around the schoolyard or park. Have them create their own animal home on a piece of construction paper. (Use cup as an optional cave or borrow) This is their own home so they can be as creative as they want. They can build a nest, beaver dam, cave, or borrow.

Conclusion:
Bring out the KWL chart and finish the part on what they learned about animal habitats. Show them the animal pictures again and ask them where each one lives.

Other Classroom Ideas:
Visit the beaver dam at Hartley Nature Center.
Felt animals and animal habitats for the book center.
Have an ant farm in your class to observe the ants in their habitat

Questions for Discussion:
Do all animals live in the same home?
What are animal homes made of?
How do animals make their homes?

Taking it Further:
(Home Connections)
Take a nature hike in a park looking for animal habitats
Visit Hartley Nature Center's beaver dam

Evaluation:
Use the KWL charts from the introduction and conclusion to evaluate the lesson.

Finger plays:

Robin
Here's a nest for Robin Redbreast,
(Cup hands to form nest)
Here's a hive for Busy Bee,
(Fingertips together to form hive)
Here's a hole for Jacky Rabbit,
(Fingertips together to form hole)
And a house for me.
(Interlockfingers, knuckles up, for house))

A nest for Robby Redbreast *(cup hands)*
A hive for Betty Bee *(form a hive)*
A hole for Jackie Rabbit *(make circle)*
And a bed for me *(pretend to sleep)*

Forest
(Sung To: "Did You Ever See A Lassie ")
If you're ever in the forest,
The forest, the forest,
If you're ever in the forest,
You might see some deer.
With antlers on one;
Another might run.
If you're ever in the forest.
You might see some deer.

The Little Skunk's Hole
(*Tune: Turkey in the Straw)*
Oh, I stuck my head
In the little skunk's hole
And the little skunk said,
"Well, bless my soul!
Take it out! Take it out!
Take it out! Remove it!"

Oh, I didn't take it out
And the little skunk said,
"If you don't take it out,
You'll wish you had,
Take it out! Take it out!"
Pheew! I removed it!

Lesson plan adapted from Everything Preschool.com. (n.d.) Everything Preschool retrieved from http://www.everythingpreschool.com/themes/index.htm

Lesson plan adapted from Preschool Education (2010) Preschool Education retrieved from http://www.

Lesson Plan
A Long Winter's Nap

National Science Education Standards	Minnesota's Early Learning Standards	NAEYC Early Childhood Program Standards
Level K-4 **Life Science:** Characteristics of organisms **Science I personal and social perspectives** Characteristics and changes in populations Changes in environments	**Scientific Thinking and Problem-Solving** **Observing:** 1. Use senses to explore materials and the environment. **Questioning:** 3. Express Wonder about the natural world. 4. Ask questions and seek answers though active explorations.	**2.G.02** Children are provided varied opportunities and materials to learn key content and principles of science such as: the differences between living and nonliving things and life cycles of various organisms. **2.G.06** Children are provided varied opportunities and materials that encourage them to think, question, and reason about observed and inferred phenomena.

Objective: The students will be able to explain hibernation.
The students will be able to identify animals that hibernate the winter.
The students will be able to identify how animals adapt in the winter.

Concepts: The students will learn how animals adapt to winter seasonal changes.

Skills: Observing
Sorting
Describing

Key Words: Hibernation, Sleep, Winter, Migrate, Adapt

Learning Centers:

Learning Center:	Preparation:	Activity:
Teacher-Directed Science Center:	Two bowls of ice water, Crisco, gloves, and baggies	Discuss how animals adapt for winter by having layer of fat called blubber. Cover

		child's one gloved hand with Crisco and put a baggy over it. Put plain hand in ice water and hand with glove with Crisco in another bowl. Have them describe the difference. Crisco is like the layer of fat.
Block Center	Add yogurt containers, toilet paper rolls, other objects to use as caves, and plastic woodland animals	Build caves for animals to hibernate in.
Sensory Table:	Half a Kleenex box, brown play dough with coffee grounds to add texture, sticks, grass, pine needles etc... and plastic animals	Add brown play dough to a Kleenex boxes to create a cave for animals to hibernate in! Use natural materials to create a forest.
Math	Animal cut-outs	Sort animals that hibernate and ones that do not hibernate.
Dramatic Play	Black cloth, stuffed bears and plastic toy bats	Create a cave for kids to pretend to hibernate like bears and bats.
Outdoor Playground	Snow	Create a snow cave in the schoolyard and let the kids to pretend to hibernate in the winter.

Large Group Outdoor Activities:

Intro:
Ask the students what is the season. (winter) Have the students brainstorm about what animals may do to get through the winter. Create a concept map of what animals do in the winter. Then show them pictures of animals in winter to help them understand several strategies. Let the students explain the pictures. The pictures will be of a hibernating mammal, birds migrating, a cold blooded animal burrowed in the mud, a snowshoe hair picture comparing color from summer to winter.

Just like animals, we adapt to the cold weather in Minnesota. Ask the students what they do differently in the wintertime then in the summer. (Wear warmer clothes) Show a picture of a preschooler bundled up in boots, jacket, hat, scarf, etc.

Day 1:

Materials:
Dixie cups cut in half
Natural materials
Glue
Construction paper
Little paper cut-outs of animals who hibernate

Discuss how animals get ready for winter by gathering bedding and food before they hibernate to create a home for the winter. Explain that they will be creating their own individual cave or burrow for the winter. Either let the students go outdoors to gather materials before it snows or have some leaves, pine needles, pinecones, moss, etc. ready for the project. Have each student glue a half cup on its side onto a piece of construction paper. Then glue on natural materials on the cave or burrow to create a comfortable home for the winter. Lastly glue on an animal of choice that hibernates all winter.

Day 2:

Explain that they will play a Hibernation Game. Have all the children sit in a circle. One child will sit in the middle and pretend to sleep all curled up like a bear hibernating. Make sure their eyes stay closed! Pick a child and have them sneak up and touch the bear then quickly return to their spot in the circle. Then everyone in the circle says WAKE UP SLEEPY BEAR! WAKE UP! Have the child then sit up and have to guess who woke them up. Let them guess 3 times. You can vary the game by letting them ask three yes or no questions, such as was it a boy or do they have on a red shirt on etc.

Conclusion:
Bring out the concept map and add new knowledge about animal hibernation that the students have learned.

Other Classroom Ideas:
Pretend to be bears taking a nap during naptime.
Have a PJ day with stuffed bears to celebrate hibernation.
Read Hibernation Books.

Questions for Discussion:
What do bears do in the winter?
What is the word that means sleep all winter?
What other animals hibernate in the winter?
Who flies south in the winter?
Do all birds fly south in the winter?
How do we adapt to winter?

Taking it Further:
(Home Connection)
Create a bear cave with a sheet at home.
Create animal caves with play dough at home.

Evaluation:
Compare the concept map from the introduction and the conclusion to evaluate the lesson and knowledge of the students.

Finger plays:

Hibernation Song
(Tune: wheels on the bus)
The weather's getting cold so bundle up, bundle up, bundle up
The weather's getting cold so bundle up, winter's coming soon.
The bears in the cave sleep all the time
The squirrels in the trees get lots of nuts
The frogs and toads go deep in mud
The ducks and the geese go flying south
The people in the town wear hats and gloves

Hibernation Song
(Tune: Are You Sleeping)
Bear is sleeping, bear is sleeping
In the cave, in the cave.
I wonder when he'll come out,
I wonder when he'll come out
In the spring, In the spring.

Birds are flying, birds are flying
In the sky, in the sky.
I wonder when they'll come back,
I wonder when they'll come back,
In the spring, in the spring.

Hibernation
(Tune: of Allouette)
Chorus:
Hibernation, time for hibernation,
Hibernation, time to go to sleep.

In the winter, where's the bear?
Sleeping in its log or lair.
Where's the bear? Log or lair. Oh!
Chorus
In the winter, where's the frog?
Sleeping by a pond or log.
Where's the frog? Pond or log.
Where's the bear? Log or lair. Oh!
Chorus

In the winter, where's the snake?
In the mud beneath beneath the lake.
Where's the snake? In the lake.
Where's the frog? Pond or log.
Where's the bear? Log or lair. Oh!
Chorus
In the winter, where' the bat?
In a cave is where it's at.
Where's the bat? A cave it's at.
Where's the snake? In the lake.
Where's the frog? Pond or log.
Where's the bear? Log or lair. Oh!

Lesson plan adapted from The Perpetual Preschool. (1996). Hibernation Science. retrieved from http://www.perpetualpreschool.com/preschool_themes/hibernation/hibernation_science.htm

APPENDIX E

NEWSLETTERS

Nature News

Monthly Nature Lesson

This month the nature's theme is "Winter Wonderland". During this month, your student will be discovering the seasonal changes of winter. They will be taking a closer look at snow and ice. Some activities this month include bringing snow inside in the science and sensory center, observing how water freezes outside, counting how many days it snows this month, and catching snowflakes on a frozen piece of paper. They will be enjoying the snow by making snowmen, snow forts, and snow angels. Please feel free to enjoy the snow with your family with outdoor adventures of your own.

Finger Play

Snow is Falling all Around
(Tune: Twinkle, Twinkle Little Star)
Snow is falling all around,
Falling, falling, to the ground.
I catch snowflakes on my tongue.
Building snowmen is such fun.
Snow is falling all around,
Falling, falling, to the ground.

Duluth Outdoor Resource:

Enjoy the winter scenery by snuggling under blankets on a sleigh ride with your family.

For more information visit http://www.lutsenresort.com/activities/sleigh.htm or http://www.okontoe.com/sleighrides.htm

Interesting Nature Fact:

The average annual snowfall in Minnesota varies from 36 inches in the southwest to more than 70 inches along the Lake Superior "snow belt." By far the snowiest areas in Minnesota are the Lake Superior highlands, a ridge of higher terrain along Minnesota's "north shore." In addition to receiving snow from the large-scale weather systems moving through the Midwest, the Lake Superior highlands experience localized snow events as well. These localized events are caused by moisture-laden breezes moving onshore from the lake and up the slope, creating and depositing snow.

MN Department of Natural Resources. (2010). Climate frequently asked questions retrieved from http://www.dnr.state.mn.us/index.html

Nature News

Monthly Nature Lesson

This month's nature lesson is called, "Who has been in the Woods." Your students will be learning about animal tracks. The winter snow provides a nice opportunity to view animal tracks. The students will be hiking outdoors, looking for animal tracks as well as other animal signs such as nests and scats. They will also be looking at their own tracks in, the snow, comparing animal tracks to human tracks. Some other activities this month include painting their hand and footprints, matching animals with their tracks, comparing tracks in snow, mud, and sand, and graphing and counting animal tracks in park. Feel free to take a hike through your neighborhood looking for animal tracks and take a photo so you can show the class what you found.

Finger Play

Boot Prints Poem

Up and down the yard, we go
Making boot prints in the snow
Big steps, little steps
Around and around
Oh what fun with snow on the ground!
Black boots, white boots
Red boots bright
Isn't it strange our boot prints are white?

Interesting Nature Fact:

The name "Minnesota" comes from the Dakota Indian name "Minisota", which means sky-tinted water.

Minnesota has the largest wolf and bald eagle populations in the lower 48 states.

Mammal species in Minnesota: 78

Amphibian species in Minnesota: 22

Reptile species in Minnesota: 29

Bird species in Minnesota: 428

Bird species that are year-round residents: 44

Minnesota plants and animals listed as Federally Endangered and Threatened: 9

Minnesota plants and animals listed as State Endangered and Threatened: 197

Duluth Outdoor Resource:

Visit the Minnesota Department of Nature Resources Website:

http://www.dnr.state.mn.us/index.html

The website has nature facts, natural resources and safety classes, and Young Naturalist articles for kids.

MN Department of Natural Resources. (2010). Animals Retrieved from http://www.dnr.state.mn.us/index.html

Nature News

Monthly Nature Lesson

This month's nature lesson plan is called "The Melt Down". As spring approaches so does the warmer weather. This month your children will discover what happens to snow and ice when the weather gets warmer. Your children will be making predictions on how long snow takes to melt in shaded areas as well as in sunny areas. They will be doing experiments with salt and ice. The preschool class will also be doing a melt down count on how many days it takes for all the snow to melt in their playground. Feel free to start one for your own yard. You can also build a snowman in your yard and observe it daily as it melts away.

Finger Play

Once there was a snowman
Once there was a snowman, snowman, snowman,
Once there was a snowman tall, tall, tall.
(reach to the ceiling)
Then the sun it melted, melted, melted,
Then the sun it melted small, small, small.
(pretend to melt)

Duluth Outdoor Resource:

Visit the Positive Energy Outdoor (ed)Ventures website: http://www.outdooredventures.org/ for outdoor activities in our area

Interesting Nature Fact:

In the United States, spring is a time of transition not only for plant and for animal life, but for the weather too. It can mean weather extremes from very cold and snowy days to humid and stormy days.

The first day of spring is March 20 (March 21 in some years) and is significant for astronomical reasons. On March 20, 2010, at precisely 1:32 P.M. EDT the Sun will cross directly over the Earth's equator. This moment is known as the vernal equinox.

Walker, N. (2004). Spring has Sprung retrieved from http://www.wxdude.com/spring.html

Nature News

Monthly Nature Lesson

This month's nature lesson plan is called "Fun in the Mud". As spring comes so does the rain and melting snow, which creates mud. This month your child will be discovering mud. They will be touching, sculpting, and painting with it. They will learn how it is made from dirt and water. The students will also be making mud bricks. They will be using these bricks to build their own mud brick houses. At home, have fun playing with mud together on a rainy day or puddle jumping. If you prefer the drier approach, you can observe the creation of mud on a rainy day in your yard from your own window.

Finger Play

A Song for Making Mud Pie

(Tune: Sing a Song of Sixpence)
Sing a song for mud pie,
It's my favorite brand.
Mix it 'til it's mushy,
Squeeze it with your hand,
Put it in a tin pan,
Leave it in the sun.
Wait about an hour,
Then you know it will be done!

Interesting Nature Fact:

Most houses in ancient Europe, Asia, and Africa as well, as some Native American tribes in North America were built out of mud brick. You take clay from the riverbank and mix it with water and straw, and pour it into wooden molds in the shape of bricks, and let it dry in the sun. When the bricks are dry, you can use them to build houses. This is a very cheap way to build houses, although it does not last very long because rain will gradually erode the mud brick.

Duluth Outdoor Resource:

Duluth has over 11,000 acres of public open space and parkland within the city limits. The trail inventory includes over 96 miles of trails.

For trail information visit: http://www.duluthmn.gov/parks/trail_pages/new_trails_page.cfm

Carr, K. (2009). Kidipede Mudbrick Retrieved from http://www.historyforkids.org/learn/architecture/mudbrick.htm

Nature News

Monthly Nature Lesson

This month's nature lesson plan is called "Spring is Sprung". Spring brings blooming plants, flowers, and trees. This month, your child will be discovering what plants need to survive, such as sun, water, and dirt. They will be planting their own flowers and watching them grow. They will be discovering a plant's life cycle and how it develops from a small seed to a beautiful plant. They will also be learning about different parts of the plants, such as roots, stems, leaves, and flowers. You can also enjoy spring by planting your own flowers at home or go visit one of Duluth's flower gardens.

Finger Play

A Little Sun

A little sun
(Hold arms above head)
A little rain
(Wiggle fingers in the air in a downward motion)
Now pull up all the weeds
(pretend to pull weeds)
Our flowers grow, all in a row
(Hold up all ten fingers lined up like flowers)
From tiny little seeds.
(Hold thumb and finger to show size of seeds)

Duluth Outdoor Resource:

Leif Erickson Park & Rose Garden (http://www.superiortrails.com/duluth-rosegardens.html) and Enger Park and Tower (http://www.superiortrails.com/duluth-engerpark.html) are just two of Duluth's fabulous gardens available for families to visit and enjoy.

The Duluth Garden Flower Society offers great gardening classes and workshops. Visit http://www.dgfs.us/ for more information.

Interesting Nature Fact:

The MN state flower is the pink and white lady's slipper. The pink and white lady's slipper (*Cypripedium reginae*) was designated the official state flower of Minnesota in 1902. Lady's slippers can live up to 50 years but develop slowly, taking up to 16 years to produce their first flower. Since 1925, Minnesota state law has protected these rare wildflowers and it is illegal to pick the flowers or to uproot or unearth the plants.

The MN state tree is the red pine, also known as the Norway pine. Minnesota designated the red pine or Norway pine (*Pinus resinosa*) as the official state tree in 1953.

MN Department of Natural Resources. (2010). State symbols Retrieved from http://www.dnr.state.mn.us/index.html
Minnesota Secretary of State. (n.d.). State Symbols Retrieved from http://www.sos.state.mn.us/student/symbols.html

Nature News

Monthly Nature Lesson

This month's nature lesson plan is called, "Feathered Friends". This month your students will be learning about birds. They will be discovering what birds are, what they eat, and where they live. Your students will be experimenting with feathers and listening to bird sounds. They will be making bird feeders and as well as their own bird nests. The students will spend time observing birds in the park and schoolyard, where they will graph how many birds they see this month. Feel free to make your own bird feeder for you yard at home. Do not forget to listen to the different birds in your own backyard.

Finger Play

If I Were a Bird

If I were a bird, I'd sing a song
And fly about the whole day long
(twine thumbs together and move hands like wings)
And when the night comes, go to rest,
(tilt head and close eyes)
Up in my cozy little nest.
(cup hands together to form nest)

Duluth Outdoor Resource:

Hawk Ridge Bird Observatory of Duluth is a great place to go bird watching.

Visit www.hawkridge.org for more information.

Don't miss the St. Louis County Birdathon on May 22, 2010 (http://www.hawkridge.org/events/birdathon.html)

Interesting Nature Fact:

The common loon (*Gavia immer*) was adopted as the official state bird symbol of Minnesota in 1961. Loons are known for their cries, wails, and yodels - their eerie, echoing calls are a distinctive feature of Minnesota's northern lakes. Loons are large black and white birds with red eyes. They have wingspans up to five feet and body lengths up to three feet. Although clumsy on land, they are high-speed flyers and excellent underwater swimmers. They will dive to depths of 90 feet in pursuit of fish. Approximately 12,000 of this unique bird make their summer homes in the Minnesota

MN Department of Natural Resources. (2010). State symbols Retrieved from http://www.dnr.state.mn.us/index.html
Minnesota Secretary of State. (n.d.). State Symbols Retrieved from http://www.sos.state.mn.us/student/symbols.html

Nature News

Monthly Nature Lesson

This month's nature lesson plan is called, "Over the River". This month your students will be learning about rivers. They will be exploring the river that runs through Lincoln Park. They will be encouraged to touch, listen, and draw or journal about the river. The students will be making river rafts from natural materials and watching them float down the river. They children will be also creating a river in their playground and in their sensory table in the classroom with sand, rocks, and water. Feel free to explore Duluth's many rivers with your family or create your own river in your backyard with a garden hose.

Finger Play

Down The River
(Tune: "Clementine")

Down the river, swiftly flowing
Comes a lovely golden boat
Light it drifts, as any feather
On the rushing sea afloat.

Not a mast or sail to guide it
On the yellow deck is seen,
But a host of tiny fairies
Taking home their Fairy Queen.

Now I tell you that my river
Was a gutter stream that flowed,
And my boat, a leaf of Maple
That the frost had turned to Gold

Duluth Outdoor Resource:

There are plenty of opportunities to enjoy MN's rivers by canoe, kayak, or just exploring.

Visit http://www.dnr.state.mn.us/watertrails/index.html for information on MN water trails, safety tips, and outfitters.

Interesting Nature Fact:

Minnesota has 6,564 (69,200 miles) natural rivers and streams. The longest being the Mississippi River. Mississippi River length in Minnesota is 680 miles. The river begins its 2,552-mile journey to the sea from its headwaters in Itasca State Park. From its ankle-deep source, the mighty Mississippi winds its way through Minnesota - from the northern wilderness through contemporary, cosmopolitan cities to rich farmlands and plains. Each bend of the river offers something new in the land of 15,000 lakes.

MN Department of Natural Resources. (2010). Rivers, Lakes, and Wetland Facts retrieved from http://www.dnr.state.mn.us/index.html

Nature News

Monthly Nature Lesson

This month nature theme is "Nature Sense". This month your children will be using their five senses to enjoy nature. We will be bringing nature into the classroom to look, smell, and feel it. Some other activities this month will include listening to nature sounds on the CDs, and tasting things that come from nature such as fruits and berries. They will also be taking a nature hike in the park using their senses to describe what they see, hear, feel, and smell. Feel free to do this with your family at home.

Finger Play

Rocks are Hard

(Tune: Three Blind Mice)

Rocks are hard
Rocks are hard
Oh so hard
Very hard
Some are very big rocks
And some are very little rocks
But all rocks are hard
All rocks are hard

Duluth Outdoor Resource:

Enjoy the taste of fall by visiting an apple orchard.

For information on apple orchards in your area visit:

http://www.pickyourown.org/MN.htm

Interesting Nature Fact:

On average, peak fall color arrives in the northern one-third of the state the middle of September to early October. The central third of the state is most colorful between late September and early October. Southern Minnesota trees reach the height of their fall color late September to mid-October One exception is the North Shore Drive, where trees along Lake Superior turn color a week later than inland trees due to the warming effect of the lake. However, fall color conditions can change rapidly due to wind, rain, and frost.

Visit Minnesota (n.d.). Minnesota Seasons retrieved from http://www.minnesota-visitor.com/minnesota-seasons.html

Nature News

Monthly Nature Lesson

This month's nature theme is called, "The Great Lake". This month your students will be taking a closer look at Lake Superior. We are so fortunate to be living near the deepest and biggest fresh water lake. They will be discovering wildlife living near and in Lake Superior, waves, boats, bridges, and rocks. Some activities include listening to waves on CD, sorting rocks found by the lake, creating bridges in the block area and creating their own waves with a blue cloth. Feel free to take a trip to Lake Superior observe all that it has to offer.

Finger Play

Down by the Shore
(Tune: Down By the Bay)

Down by the shore
In the sand and the sun,
I like to dive
And splash and run.
And as the waves
Roll out and in,
I'll get warm in the sun
And have lots of fun,
Down by the shore!

Duluth Outdoor Resource:

Visit The Great Lakes Aquarium to learn more about the wildlife around and in Lake Superior.

Visit http://www.glaquarium.org/ for more information on tickets, exhibits, and programs.

Interesting Nature Fact:

The Great Lakes make up the largest freshwater system in the world. The five Great Lakes cover a total area of 94,000 square miles (244,000 square kilometers), and contain approximately 18% of the world's fresh surface water. Lake Superior is the largest, deepest, and coldest of the Great Lakes. Measured across its greatest dimensions, it is 350 miles (563 kilometers) long and 160 miles (260 kilometers) wide. It has a surface area of 31,700 square miles (82,100 square kilometers) making it the largest freshwater lake in the world, based on surface area. The deepest point of the lake, located about 40 miles (65 kilometers) north of Munising, Michigan, is 1335 feet (405 meters) deep. The lake holds approximately three quadrillion gallons (11.4 quadrillion liters) of water – more than half the water in all the Great Lakes combined. The average annual surface water temperature for Lake Superior is approximately 40°F (4.4°C).

Superior Outdoor Inc. (2009). Eco Tour: About Lake Superior retrieved from http://www.superiorecotour.com/index.php/about-lake-superior.html

Nature News

Monthly Nature Lesson

This month's nature lesson is called "Fall into Autumn. During this month, your students will discover the seasonal changes in autumn. They will be taking a nature hike gather leaves, acorns, pinecones, pine needles, and other nuts. They will be making autumn collages, wreaths, and leaf rubbings. They will be also looking closer at nature with magnify glasses and opening acorns and other nuts. They will be also be enjoying running and jumping in leaves. At home, feel free to enjoying raking and jumping in leaves as well as creating your own nature collages, and leaf rubbings.

Finger Play

The Leaves are Falling Down

(Tune: "The Farmer in the Dell")

The leaves are falling down
The leaves are falling down
Red, yellow, green and brown
The leaves are falling down

Interesting Nature Fact:

A leaf is like a miniature factory. It takes the ingredients of sunlight, water, carbon dioxide, and chlorophyll to make food for itself. In autumn, there is less sunlight because the days are shorter. Because sunlight is a crucial ingredient in the leaf "factory", the leaf is unable to sustain itself any longer. It becomes weak, breaks from the branch, and floats to the ground.

Duluth Outdoor Resource:

Enjoy the fall colors on a train ride up the north shore on the north shore scenic railroad.

For more information visit: http://www.northshorescenicrailroad.org/Home/Home.aspn.

Don't forget to visit their Lake Superior Railroad Museum.

Watson, D. E. (2009). FT Exploring Science & Technology Education retrieved from http://www.ftexploring.com/photosyn/chloroplast.html

Nature News

Monthly Nature Lesson

This month the nature theme is "Whose Home is This?" During this month, your student will be discovering animal habitats. They will be discussing what animal habitats, homes look like, and which animal lives there. They will be taking a nature hike through the park looking for animal habitats such as rabbit holes, bird nests, and animals that live in the river. They will be making their own animal home out of natural materials they gathered from the schoolyard or park. They will be playing a matching game with animals and their homes. At home, take a nature hike at a local park or around your neighborhood looking for animal habitats.

Finger Play

Robin Redbreast

Here's a nest for Robin Redbreast,
(Cup hands to form nest)
Here's a hive for Busy Bee,
(Fingertips together to form hive)
Here's a hole for Jacky Rabbit,
(Fingertips together to form hole)
And a house for me.
(Interlock fingers, knuckles up, for house))

Duluth Outdoor Resource:

See animals in their habitats at the Lake Superior Zoo.

Visit http://www.lszoo.org/ for more information.

The zoo also offers classes and camps for kids.

Interesting Nature Fact:

Minnesota is a land of lakes, rivers, prairies, and forests. More than 4 million people and 2,000 species of plants and animals live here. Wherever we live - in a city, on a farm, by a lake - we are part of a large plant and animal community called a biome. Minnesota has three biomes: coniferous forest, deciduous forest, and prairie.

MN Department of Natural Resources. (2010). Young Naturalists retrieved from http://www.dnr.state.mn.us/young_naturalists/biome/index.html

Nature News

Monthly Nature Lesson

This month the nature theme is called, "A Long Winter's Nap". This month the students will be learning about hibernation. They will be identifying animals that hibernate in the winter and the ones that stay awake. They will be creating a cave in their dramatic play area and pretending to hibernate like a bear. They will be creating their own animal den out of natural materials. The students will also be creating a bear cave in the snow. Feel free to create your own cave outside either with snow or with a sheet inside the home and pretend to hibernate through the winter like bears.

Finger Play

Hibernation Song

(Tune: Wheels on the Bus)

The weather's getting cold so bundle up, bundle up, bundle up
The weather's getting cold so bundle up,
winter's coming soon.
The bears in the cave sleep all the time
The squirrels in the trees get lots of nuts
The frogs and toads go deep in mud
The ducks and the geese go flying south
The people in the town wear hats and gloves

Duluth Outdoor Resource:

Look for animals while snow shoeing, hiking or skiing as a family at Hartley Nature Center

Visit: http://www.hartleynature.org/index.html for more information on Hartley Nature Center and its programs

Interesting Nature Fact:

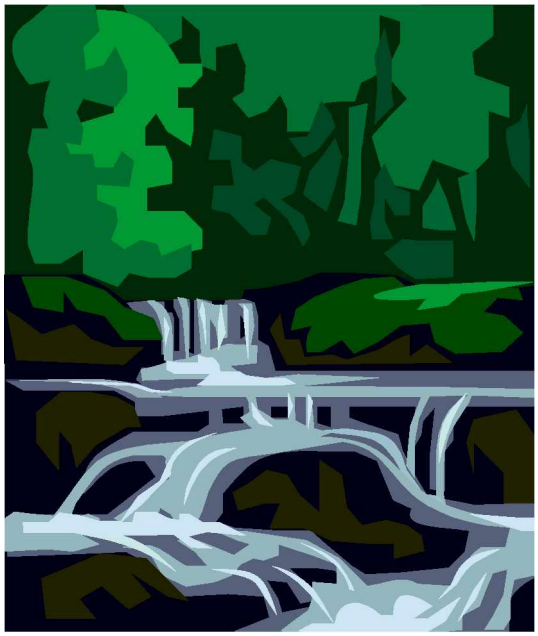
Hibernation occurs when an animal becomes inactive, or "sleeps," during the short, cold days of winter. Hibernating and dormant mammals include bears, squirrels, groundhogs, raccoons, skunks, opossums, dormice, and bats. Frogs, toads, turtles, lizards, snakes, snail, fish, shrimp, and even some insects also hibernate or are dormant during the winter. To prepare for hibernation, many animals eat to gain weight in the summer and fall. The extra fat keeps them alive during the winter. A black bear can gain up to 30 pounds a week during its pre-hibernation eating binge. During the fall, hibernating animals prepare nests for their winter sleep. Some store extra food in their nests. Some hibernating animals wake for short periods during hibernation to eat and relieve themselves. Others sleep through the entire winter. During hibernation, the heart rate for many animals

Scholastic Inc. (2010) Fun Hibernation Facts retrieved from http://www2.scholastic.com/browse/subarticle.jsp?id=4224

APPENDIX F

TRAINING MANUAL

Early Childhood Nature Curriculum Teacher Training Manual



This is an Early Childhood Nature Curriculum for the formal Early Childhood Classroom. This curriculum includes twelve monthly lessons and their corresponding newsletters. Each individual monthly lesson has its own theme that emphasizes nature appreciation and sensory awareness with positive interactions with the environment. Each lesson also consists of outdoor experiences as well as integrating nature into the indoor environment. The indoor nature experiences are integrated into learning centers throughout the daycare. These twelve lessons are material extensive, interdisciplinary, and experiential. The newsletters are designed to keep the parents informed in the curriculum. Each newsletter describes the theme and some of the activities being taught as well as activities that they can do at home with their child. There is also a fun nature fact, a finger play, and a Duluth resource included in the newsletter. The newsletters are to be given out at the beginning of each lesson.

Purpose of Curriculum

This curriculum provides environmental education lessons to be taught monthly to students at an early childhood education center in the Midwest United States. Each lesson focuses on various aspects of nature awareness and appreciation while nurturing student development in the areas of inquiry and problem solving, age appropriate thinking skills, and friendship building; concepts which have been shown through research to be highly beneficial for youth in the primary grade levels or kindergarten thru third grade. (Davis, 1998; Flanagan, 2006; White, 2004). The learning outcome in this curriculum are aligned with Minnesota's Early Learning Standards,

NAEYC (National Association for the Education for Young Children) Early Childhood Program Standards, and The National Education Science Standards.

Significance of Curriculum

Many researchers of environmental education have found it useful to investigate the benefits of environmental education as they pertain to school aged youth. These studies have primarily indicated results that are positive; both physically and academically (Fjortoft, 2001; Wilson, 1992). For example, Wilson (1992) found that positive interactions with the natural world are an important part of healthy child development both physically and cognitively. Children who are close to nature tend to relate to it as a source of wonder, joy, and awe; their spirits are nurtured by nature and they discover through it "sources of human sensibility" (1992, p. 348). According to Wilson (1992), these interactions enhance learning and the quality of life over the span of ones lifetime. Additionally, Wilson (1994) has also conducted studies on the effects of participation in environmental education, the results of which have indicated that environmental education helps strengthen learning in core subjects such as science, math, geography, languages arts, and social studies (Wilson 1994). Supporting Wilson, Fjortoft (2001) states that daily play experiences in a natural area significantly increases balance and coordination among young children, and is beneficial to one's spirit and emotions.

In congruence with the movement toward inclusion of environmental and nature based learning in the preschool setting, others have indicated the negative effects of not having environmental education in early childhood curricula. For example, White (2004)

noted that not only does the loss of children's outdoor play and contact with the natural world negatively affect the growth and development of the whole child and their acquisition of knowledge; it also sets the stage for a continuing loss of the natural environment.

Ruth Wilson's (1996) guidelines for developing and implementing an environmental education program for preschool-aged children:

1) Begin with simple experiences. Young children learn best through experiences that relate to what is already familiar and comfortable. Thus, the best place to start is in an environment similar to what they already know. For example, focus on a single tree in a backyard or playground before venturing into a heavily wooded area.

2) Provide frequent positive experiences outdoors. Because children learn best through direct, concrete experiences, they need to be frequently immersed in the outdoor environment to learn about it.

3) In addition to investigating the elements of the natural world already present in an outdoor setting, you can use many different strategies to transform a typical playground into an environmental yard. Start by adding bird feeders, windsocks, flower and vegetable gardens, tree houses, rock piles, and logs.

4) Then, provide your child with tools for experimenting and investigating (for example, a magnifying glass, water hose and bucket, hoe, rake). Focus on "experiencing" rather than "teaching". Because young children learn through discovery and self-initiated activities, an adult should serve more as a facilitator than

a teacher. Learning among young children requires active involvement -- hands-on manipulation, sensory engagement, and self-initiated explorations. Focus on what children find of interest rather than competing for attention through adult-selected activities and materials.

5) Demonstrate a personal interest in and enjoyment of the natural world. Your expressions of interest in and enjoyment of the natural world are critical to your child's interest in the environment. Your own sense of wonder, more than your scientific knowledge, will ignite and sustain a child's love of nature. Therefore, even parents with a minimal background in science should not be intimidated by the thought of implementing an environmental education program for young children. Feelings are more important than facts when introducing young children to the natural world.

6) Model caring and respect for the natural environment. Parents should model caring and respect for the world of nature. Talking to children about taking care of the Earth is far less effective than demonstrating simple ways of expressing care. Care and respect can be modeled by gently handling plants and animals in the classroom, establishing or maintaining outdoor habitats for wildlife, properly disposing of trash, and recycling or reusing as many materials as possible.

7) Young children often develop an emotional attachment to what is familiar and comfortable to them. If they are to develop a sense of connectedness with the natural

> world, they need frequent positive experiences with the outdoors. Providing opportunities for such experiences and sharing them with young children is the essence of environmental education. Environmental education for the early years focuses primarily on young children exploring and enjoying the world of nature under the guidance and with the companionship of caring adults. (Wilson, 1996)

The Twelve Lessons

The twelve lesson plan themes are:

January: Winter Wonderland

The purpose of this lesson is for the preschoolers to discover the seasonal changes of winter.

February: Whose been in the Woods

The purpose of this lesson is for the preschoolers to learn how to look for animal signs in nature, such as tracks and scat.

March: The Melt Down

The purpose of this lesson is for the preschoolers to learn what happens to the snow and ice when the weather gets warmer.

April: Fun in the Mud

The purpose of this lesson is for the preschoolers will learn how mud is created from dirt and water.

May: Spring has sprung

The purpose of this lesson is for the preschoolers to learn different parts and the life cycle of plants.

June: Friendly Feathers

The purpose of this lesson is for preschoolers to learn about different bird characteristics, where they live, and what they eat.

July: Over the River

The purpose of this lesson is for the preschoolers to learn characteristics and use of rivers.

August: Nature Sense

The purpose of this lesson is for the preschoolers to learn how to use their five senses in nature.

September: The Great Lake

The purpose of the lesson is for the preschoolers to learn different characteristics in and around Lake Superior.

October: Fall into Autumn

The purpose of the lesson is for the preschoolers to learn about the seasonal changes in the Autumn.

November: Whose Home is this?

The purpose of the lesson is for the preschoolers to learn that animals have different homes or habitats

December: A Long Winter's Nap

The purpose of this lesson is for the preschoolers to learn how animals adapt to the seasonal changes in winter.

Lesson Plan Resources:

http://www.dnr.state.mn.us

http://www.dnr.state.mn.us/young_naturalists

http://www.everythingpreschool.com/themes/index.htm

http://kindernature.storycounty.com/aboutus.aspx

http://www.perpetualpreschool.com

http://www.parentingscience.com

http://stepbystepcc .com/science.html

Duluth Resources:

http://www.dgfs.us/

http://www.dnr.state.mn.us/watertrails/index.html

http://www.duluthmn.gov/parks/trail_pages/new_trails_page.cfm

http://www.glaquarium.org/

http://www.hartleynature.org/index.html

www.hawkridge.org for more information

http://www.lutsenresort.com/activities/sleigh.htm

http://www.lszoo.org/

http://www.northshorescenicrailroad.org/Home/Home.aspn

http://www.okontoe.com/sleighrides.htm

http://www.outdooredventures.org/

http://www.pickyourown.org/MN.htm

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Fjortoft, I. (2001). The Natural Environment as a Playground for Children: The Impact of Outdoor Play Activities in Pre-Primary School Children. *Early Childhood Education Journal.* 29(2): 111-117

Flanagan, R. (2006) Education and Environmental: Partners for Change. *EETAP: Environmental Education & Training Partnership.* 1-18

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